Attachments

BAY AREA ENVIRONMENTAL INC.
WASTE MANAGEMENT SERVICES

February 1, 1988

Mr. Michael R. James
Chief, Facility Permitting Unit
Department of Health Services
Toxic Substance Control Division
5901 Cristy
Emeryville, CA 94608

Dear Mr. James:

I am writing to inform your office of a change made at our TSDF during 1987, EPA ID #CAT 080014079. The original permit called for 53 drums in the Flammable storage area. The dimension of the area was 20' deep and approximately 20' wide (see A-1). Although original drawings submitted to DOHS show the area to be 30' deep and 19' 3" wide. In approximately May of 1987, we added the 10 feet that was detailed in the original drawing. This change would allow for 84 drums to be stored in the Flammable Area under the existing roof.

The Flammable storage area is now the same size as the Oxidizer, Acid and Poison area. Flammables are still more than 40' away from the property line on all sides as per specifications of the permit and the Richmond Fire Department. The attached drawing shows the dimensions of the existing pad with roof elevations (A-2, A-3).

Operationally, Flammable Solvents and Lab-Packs are almost always either recycled or incinerated. Capacity for incineration is greatly lacking at this time and longer residence times are required for these waste in our facility. It is imperative to have additional space to manage these waste streams.

We would appreciate a negative declaration on this change. Our upcoming permit renewal application will specify the new capacity of 84 drums for the Flammable storage area. This change will benefit our ability to manage these wastes.

Sincerely,

David Burton

David Burton
Hazardous Material Specialist

DMB/aan

1125 HENSLEY STREET, RICHMOND, CALIFORNIA 94801 (415) 233-8001

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
999 18th STREET—SUITE 500
DENVER, COLORADO 80202-2405

APR [illegible] 1988

Ref: HWM-RI

MEMORANDUM

TO: Karen Schwinn, Chief
California Enforcement Section
RCRA Compliance Branch

FROM: Lawrence A. Wapensky, Chief
Utah/North Dakota Section

SUBJECT: Region VIII Inspection of U.S. Pollution Control, Inc., Clive, Utah

This memorandum responds to your memorandums of January 15 and 20, 1988, requesting information concerning United States Pollution Control (USPCI), Clive, Utah.

Three inspectors from my office, along with two inspectors from NEIC, inspected USPCI on February 1-4, 1988.

Attached, are copies of USPCI records of receipt, treatment, and disposal of wastes from Bay Area Environmental, Richmond, California and from Lawrence Livermore National Laboratory, Livermore, California.

The files of USPCI contain neither notification nor certification of the wastes, as they relate to Land Disposal Restrictions, from either facility. Mr. Gary Carroll, USPCI manager, stated that notification/certification from either facility did not accompany the wastes and, in fact, had never been received by USPCI.

Should you have any questions, please contact Mel Poundstone at (303) 293-1704 or FTS 564-1704.

Attachments

SAMPLE#	LOAD TICKET#	LOAD#	MANIFEST#	EPA ID#	EPA WC1	EPA WC2	EPA WC3	HAULER	QUANTITY	TOTAL POUNDS
4924A	33278	4924	USP343	UTD067939275	NONE	NONE	NONE	UTD980635090	2 T	41900

% SOLID	S.G.	PH	NORM	SNIFF	FLASH	TOX	TOC	FREE LIQUIDS	HAND/CODES	PHYSICAL APPEARANCE	LBS--THIS A
100	1	7		<20	>140	NEG		NEG	D80/	MULTI SOLID	41

DISP/AREA	DISP/DATE	SECTION	LAYER	ROW	DRUM	THRU	DRUM	ROW TO ROW	ROW TO ROW	ROW TO ROW	TRUCK
CX	12/13	D9									FB

DESCRIPTION---PCB TRANSFORMERS PROCESS----

CUBIC FT OF TRANSFORMERS IS 2.277634E-34

****

RECORD NUMBER 9512 LOGGED BY JT **LOAD LOG** **DATE: 12/1**

3RD HC T31 4TH WC D011

GENERATOR LAWRENCE LIVERMORE NATIONAL LABORATORY
ADDRESS 7000 EAST AVE/P.O. BOX 5505 ACCEPTANCE CODE GM86-1766
CITY ST LIVERMORE, CA
ZIP 94550
TELEPHONE 415/423-0398

SAMPLE#	LOAD TICKET#	LOAD#	MANIFEST#	EPA ID#	EPA WC1	EPA WC2	EPA WC3	HAULER	QUANTITY	TOTAL POUNDS
4925	02887	4925	70032	CA2890012584	D002	D007	NONE	CAT000624247	884 G	6630

% SOLID	S.G.	PH	NORM	SNIFF	FLASH	TOX	TOC	FREE LIQUIDS	HAND/CODES	PHYSICAL APPEARANCE	LBS--THIS AR
1	1.03	13	.24	30	>140	NEG		POS/T47/NEG	T47/D80	LT BROWN LIQUID	690

DISP/AREA	DISP/DATE	SECTION	LAYER	ROW	DRUM	THRU	DRUM	ROW TO ROW	ROW TO ROW	ROW TO ROW	TRUCK T
C2	12/13	WE									T

DESCRIPTION---WASTE WATER W/SOLVENTS PROCESS----

****

RECORD NUMBER 9511 LOGGED BY JT **LOAD LOG** **DATE: 12/13**

3RD HC T31

GENERATOR LAWRENCE LIVERMORE NATIONAL LABORATORY
ADDRESS 7000 EAST AVE/P.O. BOX 5505 ACCEPTANCE CODE GM86-1672
CITY ST LIVERMORE, CA
ZIP 94550
TELEPHONE 415/423-0398

SAMPLE#	LOAD TICKET#	LOAD#	MANIFEST#	EPA ID#	EPA WC1	EPA WC2	EPA WC3	HAULER	QUANTITY	TOTAL POUNDS
4926	02886	4926	70033	CA2890012584	D002	D007	D008	CAT000624247	1142 G	9800

% SOLID	S.G.	PH	NORM	SNIFF	FLASH	TOX	TOC	FREE LIQUIDS	HAND/CODES	PHYSICAL APPEARANCE	LBS--THIS ARE
1	1.03	3.0	.12	<20	>140	NEG		POS/T47/NEG	T47/D80	CLEAR LIQUID	980

DISP/AREA	DISP/DATE	SECTION	LAYER	ROW	DRUM	THRU	DRUM	ROW TO ROW	ROW TO ROW	ROW TO ROW	TRUCK T
C2	12/13	H5									T

DESCRIPTION---WASTE ACID PROCESS----

U.S. POLLUTION CONTROL, INC.

NOTICE !!
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CUSTOMER SAMPLE REFERENCE NUMBER : GM87-2743

GENERATOR	BROKER
LAWRENCE LIVERMORE NAT'L. LAB.	Special Services
PO BOX 5505 L-620	10220 W. Reno
LIVERMORE CA 94550	Oklahoma City OK 73127
ATTENTION : MICHAEL J. HAYES	CONTACT: LARRY LABAR
PLEASE FORWARD TO ENVIRONMENTAL DEPT.!	405-324/33

ANALYST NAME : D REES

SALES REP: MP VACUUM SVC	CUSTOMER SAMPLE # : GM87-2743
SAMPLE ARRIVAL DATE : 09/17/87	SAMPLE SITE : LIVERMORE/CALIF
PROFILE ARRIVAL DATE : 09/17/87	DATE COMPLETED : 09/17/87

ACCEPTANCE/DENIAL INFORMATION

ACCEPTABLE FOR DISPOSAL WITH THE FOLLOWING TREATMENT
SOLIDIFICATION
COMMENTS: UPDATE OF GM86-1766.REQUIRES CERTIFICATE OF <1% RESTRICTED SOLVENTS
TYPE OF CONTAINER : Metal drums barrels kegs

WASTE ANALYSIS INFORMATION

WASTE PROFILE SHEET # 3222
WASTE NAME : RINSE WATER CONT. W/SOLVENT
ODOR : SOLVENT COLOR : BROWN
PHYSICAL STATE : LIQUID

Specific Gravity : 1.03
pH : 13.0
Normality : 0.18
% Solids : 1.0
TLV Sniffer : 30
Flash Point : >140
Heating Value BTU/LB :
Heating Value BTU/GAL :
Hexavalent Chromium Cr :
Water Soluble :
Sulfides :
Organic Chlorides : NEG
TOX : NEG
TOC : N/A
Cyanides as CN Total mg/l :
Cyanides as CN Free mg/l : NEG
PCBs :
TOX Leachate :
Free Liquids : POS

PROCESS PRODUCING WASTE : PRINTED CIRCUIT BOARDS

APPROVAL _____ DATE 9/26/87 DENIAL _____ DATE _____
APPROVAL _____ DATE _____ DENIAL _____ DATE _____

U.S. POLLUTION CONTROL, INC.

Special Services GM86-1766

HAZARDOUS WASTE PROFILE SHEET

3222

EXHIBIT A TO _____ Contract Dated _____

As prescribed by the Resource Conservation and Recovery Act (Public Law 98-580 Sec. 3004), a detailed chemical and physical analysis must be submitted before we can handle your waste stream. This information is necessary to help us evaluate whether we can safely and economically transport and dispose of your controlled industrial wastes in an environmentally sound manner. Be as complete as possible. If an area is not applicable, mark as such. Should a laboratory analysis be available, please attach it to this form. We can arrange analytical laboratory services, if neded, for an appropriate fee. All information we receive will be held in strictest confidence to protect your interests. **SAMPLE WILL NOT BE PROCESSED UNLESS ALL AREAS OF THIS SHEET ARE PROPERLY FILLED IN.** A fee of _____ will be charged for processing this sample.

Sales Representative _____

I. Generator Information ( ) Check if small quantity Generator per CFR-40

Name of Company Lawrence Livermore National Laboratory US EPA ID CA2890012581

Facility Address 7000 East Ave Livermore Ca

Mailing Address PO Box 5505, L-620 Livermore Ca 94550

Technical Contact Mike Hayes Title Shipping Coordinator Phone (415) 422 1925

General Contact E.R. Taylor Title Operations Manager Phone (415) 4230398

II. Waste Stream General Information

Waste Name Solvent contaminated rinse water ANTICIPATED VOLUME 10,000 gal per year X per month _____ per week _____ one time only _____

Process Producing Waste making printed circuit boards Color clear Odor slighty solvent

III. Waste Properties

Physical State @ 25°C: (X) Liquid ( ) Powder ( ) Solid ( ) Sludge

Layers: (X) Single Phase ( ) Bi-layered ( ) Multi-layered

Free Liquids: (X) Yes ( ) No

pH 6-8-13 Normality N/A 1

Type Acid N/A Type N/A

Density ~ 1 g/ml Caustic N/A

(X) Organic ( ) Inorganic

Flash Point 7200 °F

Chemical Composition ( )% (X) PPM (List all known)

	Range Lower	Upper
Acetone	(10)	(1500)
1,1,1-Trichloroethane	(0)	(50)
Lacquer thinner	(0)	(1000)
Water - balance	(_)	(_)
Caustic Tank	(_)	(_)
Residue in	(_)	(_)
Methylene Chloride	(_)	(1000)

Ref Mike Hayes

Metals-EP Tox Test Mg/l or PPM

Arsenic (As)	(0)	Lead (Pb)	(0)	Nickel (Ni)	(25)
Barium (Ba)	(0)	Vanadium (V)	(0)	Zinc (Zn)	(25)
Cadmium (Cd)	(0)	Selinium (Se)	(0)	Thallium (Ti)	(0)
Chromium (Cr)	(250)	Silver (Ag)	(0)	Cobalt (Co)	(0)
Mercury (Hg)	(0)	Cooper (Cu)	(250)		

Possible Component (include unit of measure)

Cyanides	0	2, 4, D	0	Dioxin	0
Sulfides	0	Phenolics	0	Organic Chlorides	1500 ppm

1500 per Mike Hayes

IV. PCB Oil: Type N/A Concentration _____ % ppm _____ PCB Equip: Type _____ Concentration _____ % ppm _____

PCB Solids: Type _____ Concentration _____ % ppm _____ Has equipment been drained and flushed according to 40 CFR Part 761? ___

Attach information for dimensions, weight and nameplate capacity for all equipment.

V. Hazardous Characteristics (From CFR-40)

U.S. EPA Hazardous Code(s) F003, F001, F002 D007, D002

Is the waste ( ) Pyrophoric ( ) Infectious ( ) Water reactive ( ) Radioactive ( ) Pathogenic ( ) Explosive ( ) Pesticides/Herbicides ( ) Biological ( ) Shock sensitive ( ) Etological

VI. Shipping Information (From CFR-40)

Proper DOT Shipping Name Hazardous Waste, liquid, N.O.S.

DOT Hazard Class ORM-E UN/NA Number NA 9189 Reportable Quantity _____

Method of Shipment (X) Bulk Liquids ( ) Bulk Solids ( ) Drums ( ) Other

Special Handling and Safety Instructions Wear protective clothing

The samples have been collected using the appropriate EPA sampling guidelines

I certify and warrant that the above information, the information attached, and the waste stream as described is true and correct to the best of my knowledge and ability and not willful of deliberate omissions exist and that all known and/or suspected hazards have been disclosed, and a sample representative of the waste stream has been or is being sent to the proper facility.

Signature Title Shipping Coordinator Date 11-28-86

U.S. POLLUTION CONTROL, INC.

GRASSY MOUNTAIN FACILITY
WASTE ANALYSIS
SAMPLE SHEET

ANALYST D. Rees

GM8 1-~~2~~2743 WASTE PROFILE SHEET # 3220 BROKER # _____

DATE RECEIVED 9/17/87 GENERATOR Lawrence Livermore National Lab

DATE OF ANALYSIS 9/17/87 WASTE NAME solvent cont. w/ rinsewater

****

solvent	ODOR		HEATING VALUE BTU/lb
brown	COLOR		HEATING VALUE BTU/gal
PHYSICAL STATE: LIQUID (X) SOLID ( ) SLUDGE ( )			HEX CHROMIUM mg/l
pos	FREE LIQUIDS		WATER SOLUBLE
3.74	FLYASH FACTOR	neg	SULFIDES
1.03	SPEC. GRAVITY	neg	TOX
13.0	PH		TOX LEACHATE
0.18	NORMALITY		TOC
7.0	% SOLIDS	neg	CYANIDES as CN FREE mg/l
30	TLV SNIFFER		CYANIDES as CN TOTAL mg/l
>140	FLASH POINT		PCB's ppm
	ASH CONTENT ON IGNITION		

****

SALES REP: _____ TYPE OF CONTAINER: TT

COMMENTS: profile update of GM86-1766. Must have certif of < 1% restricted solvents by weight

BILLING:
STANDARD ( ) RUSH ( ) ON ARRIVAL/EMERGENCY ( )
SM QTY GEN ( ) LAB PACK ( ) NONE (X)

OUTSIDE LAB ANALYSIS: _____

TREATMENT: acceptable
NEURTALIZATION ( ) SOLIDIFICATION (X) CHROMATE REDUCTION ( )
ENCAPSULATION ( ) SOLVENT RECOVERY ( ) BOILER FUELS ( )
OTHER: _____

LAB ACCEPTANCE [signature] DATE 9/21/87 LAB DENIAL _____ DATE _____

5662 South 300 West • Murray, UT 84107 • 801/266-3908

U.S.
POLLUTION
CONTROL, INC.

SAMPLE UPDATE CERTIFICATION

GENERATOR: Lawrence Livermore Nat'l. Lab. EPA ID # CA2890012584

ADDRESS: PO Box 5505, L-620

CITY Livermore CA STATE CA ZIP 94550

U.S.P.C.I. SAMPLE REFERENCE NUMBER See Attachment A date 8-20-87

WASTESTREAM NAME various

I HEREBY CERTIFY THE CHEMICAL AND PHYSICAL CHARACTERISTICS AS WELL AS THE PROCESS GENERATING THE ABOVE NAMED WASTESTREAMS HAS NOT CHANGED DURING THE PAST YEAR.

Michael R Hayes

GENERATOR (AUTHORIZED SIGNATURE)

Shipping Supervisor

TITLE

9-7-87

DATE

ATTACHMENT A

SAMPLE UPDATE REQUIRMENTS

GENERATOR Lawrence Livermore National Laboratory EPA ID # CA2890012584

ADDRESS P.O. Box 5505, L-620

CITY Livermore STATE Ca ZIP 94550

DISTRIBUTION DATE: 8-20-87

MARKETING REPRESENTATIVE: _____ BROKER _____

WASTESTREAM NAME	SAMPLE REFERENCE #	PROFILE REQUIRED	CERT. REQUIRED
coolant/wash waters	GM86-1903		
acid rinse water	GM86-1785		
asbestos	GM86-1770		
Solvent contaminated rinse water	GM86-1766		
soils w/ metal contamination	GM86-1768		
caustic rinse water	GM86-1751		
chemical contaminated pallets	GM86-1964		
Non-PCB Electronical Equipment	GM86-1733		
chromic & sulfuric acid	GM86-1672		
Laser dye wash water	GM86-1671		
~~waste [illegible]~~	~~GM86-1676~~		
sulfamic acid & potassium dichromate	GM86-1649		
Treated H20 w/Cr & NI	GM86-1374		
Non-PCB Transformer	GM86-1345		

U.S. POLLUTION CONTROL, INC.

COMPLETED

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CUSTOMER SAMPLE REFERENCE NUMBER : GM86-1766

GENERATOR	BROKER
LAWRENCE LIVERMORE NATIONAL LABORATORY	Special Services
7000 EAST AVE	10220 W. Reno
LIVERMORE CA 94550	Oklahoma City OK 73127
CONTACT : MICHAEL N. HYNES	CONTACT: Charles Soukup
TELEPHONE : 415-422/0398	405-324/33

ANALYST NAME : TIM LAVER
SALES REP:
SAMPLE ARRIVAL DATE : 12/13/86
PROFILE ARRIVAL DATE : 12/13/86
CUSTOMER SAMPLE # : GM86-1766
SAMPLE SITE : LIVERMORE/CALIF
DATE COMPLETED : 12/13/86

ACCEPTANCE/DENIAL INFORMATION

ACCEPTABLE FOR DISPOSAL WITH THE FOLLOWING TREATMENT
SOLIDIFICATION
COMMENTS: Solvents must be less than 1% & stated on manifest
TYPE OF CONTAINER : Metal drums barrels kegs

WASTE ANALYSIS INFORMATION

WASTE PROFILE SHEET # 3222
WASTE NAME : SOLVENT CONT W/RINSE WATER
ODOR : SOLVENT
COLOR : BROWN
PHYSICAL STATE : LIQUID

Specific Gravity : 1.03
pH : 13.0
Normality : 0.18
% Solids : 1.0
TLV Sniffer : 30
Flash Point : >140
Heating Value BTU/LB :
Heating Value BTU/GAL :
Hexavalent Chromium Cr :
Water Soluble :
Sulfides : NEG
Organic Chlorides : NEG
TOX : NEG
TOC :
Cyanides as CN Total mg/l :
Cyanides as CN Free mg/l : NEG
PCBs :
TOX Leachate :
Free Liquids :

PROCESS PRODUCING WASTE : MFG CIRCUIT BOARD

APPROVAL [signature] DATE 12/23/86 DENIAL _____ DATE _____
APPROVAL [signature] DATE 12-31-86 DENIAL _____ DATE _____

5662 South 300 West • Murray, UT 84107 • 801/266-3908

12/23

U. S. P. C. I.
GRASSY MOUNTAIN FACILITY
WASTE ANALYSIS/SAMPLE SHEET

GM8 6 - 1766 WASTE PROFILE SHEET # 3222

DATE RECEIVED 12-13-86 GENERATOR NAME: Lawrence Livermore Lab

DATE OF ANALYSIS 12-13-86 WASTE NAME: Solvent wash rinse water

****

slight solvent	ODOR		PCB's
light brown	COLOR		ARSENIC as AS mg/1
liquid	PHYSICAL STATE		SILVER as AG mg/1
pos.	FREE LIQUIDS		CADMIUM as CD mg/1
3.74	FLYASH FACTOR		CHROMIUM toatl as CR mg/1
1.03	SPECIFIC GRAVITY		COBOLT
13.0	PH		COPPER as CU mg/1
0.18	NORMALITY		MERCURY as HG mg/1
1.0	% SOLIDS		LEAD as PB mg/1
30	TLV SNIFFER		NICKEL as NI mg/1
>140	FLASH POINT		SELENIUM as SE mg/1
	ASH CONTENT ON IGNITION		ZINC as ZN mg/1
	HEATING VALUE BTU/1lb		BARIUM as mg/1
	HEATING VALUE BTU/gal		OIL & GREASE mg/1
	HEXAVALENT CHROMIUM Cr mg/1		NITROGEN
	WATER SOLUBLE		PHOPHORUS
Neg.	SULFIDES		AROMATICS
Neg.	TOX		ALAPHATICS
	TOX LEACHATE		ASPHALTEENS
	TOC		PARAFINES
Neg	CYANIDES as CN Free mg/1		VANADIUM
	CYANIDES as CN total mg/1	ANALYST	T. Lauer

****

SALES REPRESENTATIVE _____ MODE OF SHIPMENT TT

COMMENTS: (OTHER) _____

~~BILLING~~: STANDARD RUSH ON ARRIVAL (EMERGENCY) THIRD PARTY TOX

~~ACCEPTABLE~~ / NOT ACCEPTABLE: _____

TREATMENT: ___NEUTRALIZATION ✓ SOLIDIFICATION ___CHROMATE REDUCTION ___ENCAPSULATION
___ SOLVENT RECOVERY ___ BOILER FUELS ___ OTHER: _____

U.S. POLLUTION CONTROL, INC.

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CUSTOMER SAMPLE REFERENCE NUMBER : GM87-2857

GENERATOR

LAWRENCE LIVERMORE NAT'L. LAB.
PO BOX 5505 L-620
LIVERMORE CA 94550
ATTENTION : MICHAEL J. HAYES
PLEASE FORWARD TO ENVIRONMENTAL DEPT.!

BROKER

Special Services
10220 W. Reno
Oklahoma City OK 73127
CONTACT: LARRY LABAR
405-324/33

ANALYST NAME : MIKE HEPWORTH
SALES REP: SP SERVICES
SAMPLE ARRIVAL DATE : 09-25-87
PROFILE ARRIVAL DATE : 09-25-87

CUSTOMER SAMPLE # : GM87-2857
SAMPLE SITE : LIVERMORE CA
DATE COMPLETED : 09-25-87

ACCEPTANCE/DENIAL INFORMATION

ACCEPTABLE FOR DISPOSAL WITH THE FOLLOWING TREATMENT
COMMENTS: INCINERATION update GM86-1776
TYPE OF CONTAINER : Metal drums barrels kegs

WASTE ANALYSIS INFORMATION

WASTE PROFILE SHEET # 3212
WASTE NAME : TRICHLORETHLENE CONT. SOIL
ODOR : SOLVENT
COLOR : MULTI
PHYSICAL STATE : SOLID

Specific Gravity : 3.0 ,80
pH : 6.0
Normality :
% Solids : 92
TLV Sniffer : 300
Flash Point : >140
Heating Value BTU/LB :
Heating Value BTU/GAL :
Hexavalent Chromium Cr :
Water Soluble :
Sulfides : NEG
Organic Chlorides : POS
TOX : POS
TOC :
Cyanides as CN Total mg/l :
Cyanides as CN Free mg/l : NEG
PCBs :
TOX Leachate :
Free Liquids : NEG
PROCESS PRODUCING WASTE :

APPROVAL [signature] DATE 10-4-87 DENIAL _____ DATE _____
APPROVAL _____ DATE _____ DENIAL _____ DATE _____

U.S. POLLUTION CONTROL, INC.

GRASSY MOUNTAIN FACILITY
WASTE ANALYSIS
SAMPLE SHEET

ANALYST D. Rees

GM8 6-1776 WASTE PROFILE SHEET # 3212 BROKER # 02

DATE RECEIVED 3/27/87 GENERATOR Lawrence Livermore Nat'l Lab.

DATE OF ANALYSIS 3/27/87 WASTE NAME trichloroethylene, drpsolv

****

slight solvent ODOR

multi solid COLOR

PHYSICAL STATE:
LIQUID ( ) SOLID (X) SLUDGE ( )

Neg FREE LIQUIDS

_____ FLYASH FACTOR

.30 SPEC. GRAVITY

6.0 PH

N/A NORMALITY

92 % SOLIDS

300 TLV SNIFFER

>140 FLASH POINT

_____ ASH CONTENT ON IGNITION

_____ HEATING VALUE BTU/lb

_____ HEATING VALUE BTU/gal

_____ HEX CHROMIUM mg/l

_____ WATER SOLUBLE

Neg SULFIDES

Pos TOX

_____ TOX LEACHATE

_____ TOC

Neg CYANIDES as CN FREE mg/l

_____ CYANIDES as CN TOTAL mg/l

_____ PCB's ppm

****

SALES REP: Special Services TYPE OF CONTAINER: DM

COMMENTS: _____

BILLING:
STANDARD ( ) RUSH ( ) ON ARRIVAL/EMERGENCY ( )
SM QTY GEN ( ) LAB PACK ( ) NONE ( )

OUTSIDE LAB ANALYSIS: _____

TREATMENT:
NEURTALIZATION ( ) SOLIDIFICATION ( ) CHROMATE REDUCTION ( )
ENCAPSULATION ( ) SOLVENT RECOVERY ( ) BOILER FUELS ( )
OTHER: Incinerate

LAB ACCEPTANCE D. Rees DATE 3/27/87 LAB DENIAL _____ DATE _____

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U.S. POLLUTION CONTROL, INC.

Special Services

HAZARDOUS WASTE PROFILE SHEET

~~GM86-1776~~ 3212

EXHIBIT A TO _____ Contract Dated _____

As prescribed by the Resource Conservation and Recovery Act (Public Law 98-580 Sec. 3004), a detailed chemical and physical analysis must be submitted before we can handle your waste stream. This information is necessary to help us evaluate whether we can safely and economically transport and dispose of your controlled industrial wastes in an environmentally sound manner. Be as complete as possible. If an area is not applicable, mark as such. Should a laboratory analysis be available, please attach it to this form. We can arrange analytical laboratory services, if neded, for an appropriate fee. All information we receive will be held in strictest confidence to protect your interests. **SAMPLE WILL NOT BE PROCESSED UNLESS ALL AREAS OF THIS SHEET ARE PROPERLY FILLED IN.** A fee of _____ will be charged for processing this sample.

GM87-2857 Sales Representative _____

I. Generator Information ( ) Check if small quantity Generator per CFR-40

Name of Company Lawrence Livermore National Laboratory US EPA ID CA 2 8 9 0 0 1 2 5 8 4

Facility Address 7000 East Ave Livermore Ca. Mailing Address PO Box 5505, L-620 Livermore Ca 94550

Technical Contact Mike Hayes Title Shipping Coordinator Phone (415) 422 1925

General Contact Ed. Taylor Title Operations Manager Phone ( ) 423 0398

II. Waste Stream General Information

Waste Name Trichloroethylene and drysorb, and soil ANTICIPATED VOLUME 1 cu. yd. per year X

Process Producing Waste Spill per month _____ per week _____ one time only _____

Color _____ Odor chlorosolvent

III. Waste Properties	Layers	Free Liquids			
Physical State @ 25°C	( ) Single Phase	( ) Yes	pH 6-8	Normality N/A	(X) Organic
( ) Liquid ( ) Powder	( ) Bi-layered	(X) No	Type Acid N/A	Type N/A	( ) Inorganic
(X) Solid ( ) Sludge	( ) Multi-layered		Density varies	Caustic N/A	Flash Point 200 °F

Chemical Composition (X)% ( ) PPM

(List all known)	Range Lower	Upper
Trichloroethylene	(5)	(20)
soil	(20)	(80)
absorbant	(20)	(80)
_____	(_)	(_)
_____	(_)	(_)
_____	(_)	(_)
_____	(_)	(_)

Metals-EP Tox Test — Mg/l or PPM

Arsenic (As)	(0)	Lead (Pb)	(0)	Nickel (Ni)	(0)
Barium (Ba)	(0)	Vanadium (V)	(0)	Zinc (Zn)	(0)
Cadmium (Cd)	(0)	Selinium (Se)	(0)	Thallium (Ti)	(0)
Chromium (Cr)	(0)	Silver (Ag)	(0)	Cobalt (Co)	(0)
Mercury (Hg)	(0)	Cooper (Cu)	(0)		

Possible Component (include unit of measure)

Cyanides 0 2, 4, D 0 Dioxin 0

Sulfides 0 Phenolics 0 Organic Chlorides 5-20%

IV. PCB Oil: Type N/A Concentration _____ % ppm _____ PCB Equip: Type _____ Concentration _____ % ppm _____

PCB Solids: Type _____ Concentration _____ % ppm _____ Has equipment been drained and flushed according to 40 CFR Part 761? ___

Attach information for dimensions, weight and nameplate capacity for all equipment.

V. Hazardous Characteristics (From CFR-40)

U.S. EPA Hazardous Code(s) F001, F002

Is the waste ( ) Pyrophoric ( ) Infectious ( ) Water reactive ( ) Radioactive ( ) Pathogenic

( ) Explosive ( ) Pesticides/Herbicides ( ) Biological ( ) Shock sensitive ( ) Etological

VI. Shipping Information (From CFR-40)

Proper DOT Shipping Name Hazardous Waste, Solid, N.O.S.

DOT Hazard Class ORM-E UN/NA Number NA 9189 Reportable Quantity _____

Method of Shipment ( ) Bulk Liquids ( ) Bulk Solids

(X) Drums ( ) Other

Special Handling and Safety Instructions Wear protective clothing

The samples have been collected using the appropriate EPA sampling guidelines

I certify and warrant that the above information, the information attached, and the waste stream as described is true and correct to the best of my knowledge and ability and not willful or deliberate omissions exist and that all known and/or suspected hazards have been disclosed, and a sample representative of the waste stream has been or is being sent to the proper facility.

Shipping Coordinator 11-28-86

ZIP 94550
TELEPHONE 415/423-0398

SAMPLE#	LOAD TICKET#	LOAD#	MANIFEST#	EPA ID#	EPA WC1	EPA WC2	EPA WC3	HAULER	QUANTITY	TOTAL POUNDS
2222E	08495	2222	70060	CA2890012584	D007	NONE	NONE	CAT000624247	4 D	11760

% SOLID	S.G.	PH	NORM	SNIFF	FLASH	TOX	TOC	FREE LIQUIDS	HAND/CODES	PHYSICAL APPEARANCE	LBS--THIS AREA
100	.4	5.2		<20	>140	NEG		NEG	D80/	MULTI COLORED SOLID	627

DISP/AREA	DISP/DATE	SECTION	LAYER	ROW	DRUM	THRU	DRUM	ROW TO ROW	ROW TO ROW	ROW TO ROW	TRUCK TYP
C2	04/01	F3	6	20	10		13				FB

DESCRIPTION---WASTE SULFAMIC ACID PROCESS---

****

RECORD NUMBER 4597 LOGGED BY DM LOAD LOG DATE: 03/27/87
SHP TO ENSCO 87-019
GENERATOR LAWRENCE LIVERMORE NATIONAL LABORATORY
ADDRESS 7000 EAST AVE/P.O. BOX 5505 ACCEPTANCE CODE GM86-1776
CITY ST LIVERMORE, CA
ZIP 94550
TELEPHONE 415/423-0398

SAMPLE#	LOAD TICKET#	LOAD#	MANIFEST#	EPA ID#	EPA WC1	EPA WC2	EPA WC3	HAULER	QUANTITY	TOTAL POUNDS
2222F	08485	2222	70060	CA2890012584	F001	NONE	NONE	CAT000624247	3 D	11760

% SOLID	S.G.	PH	NORM	SNIFF	FLASH	TOX	TOC	FREE LIQUIDS	HAND/CODES	PHYSICAL APPEARANCE	LBS--THIS AREA
85.3	.31	6.8		700	>140	NEG			S01/T07	BROWN SOLID	470

DISP/AREA	DISP/DATE	SECTION	LAYER	ROW	DRUM	THRU	DRUM	ROW TO ROW	ROW TO ROW	ROW TO ROW	TRUCK TYPE
SHP	04/15										FB

DESCRIPTION---WASTE TRICHLOROETHYLENE CONT. PROCESS---

****

RECORD NUMBER 4598 LOGGED BY DM LOAD LOG DATE: 03/27/87
4TH WC D011
GENERATOR LAWRENCE LIVERMORE NATIONAL LABORATORY
ADDRESS 7000 EAST AVE/P.O. BOX 5505 ACCEPTANCE CODE GM86-1768
CITY ST LIVERMORE, CA
ZIP 94550
TELEPHONE 415/423-0398

SAMPLE#	LOAD TICKET#	LOAD#	MANIFEST#	EPA ID#	EPA WC1	EPA WC2	EPA WC3	HAULER	QUANTITY	TOTAL POUNDS
2222G	08485	2222	70068	CA2890012584	D006	D007	D008	CAT000624247	1 D	11760

% SOLID	S.G.	PH	NORM	SNIFF	FLASH	TOX	TOC	FREE LIQUIDS	HAND/CODES	PHYSICAL APPEARANCE	LBS--THIS AREA
86	1.13	6.5		<20	>140	NEG		NEG	D80/	MULTI COLORED SOLID	157

DISP/AREA	DISP/DATE	SECTION	LAYER	ROW	DRUM	THRU	DRUM	ROW TO ROW	ROW TO ROW	ROW TO ROW	TRUCK TYPE
C2	04/01	F3	6	19	15		15				FB

DESCRIPTION---WASTE CONTAMINATED SOIL PROCESS---

U.S. POLLUTION CONTROL, INC.

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CUSTOMER SAMPLE REFERENCE NUMBER : GM87-2741

GENERATOR

LAWRENCE LIVERMORE NAT'L. LAB.
PO BOX 5505 L-620
LIVERMORE CA 94550
ATTENTION : MICHAEL J. HAYES
PLEASE FORWARD TO ENVIRONMENTAL DEPT.!

BROKER

Special Services
10220 W. Reno
Oklahoma City OK 73127
CONTACT: LARRY LABAR
405-324/33

ANALYST NAME : D REES
SALES REP: MP VACUUM
SAMPLE ARRIVAL DATE : 09/17/87
PROFILE ARRIVAL DATE : 09/17/87

CUSTOMER SAMPLE # : GM87-2741
SAMPLE SITE : LIVERMORE/CALIF
DATE COMPLETED : 09/17/87

ACCEPTANCE/DENIAL INFORMATION

ACCEPTABLE FOR DISPOSAL WITH THE FOLLOWING TREATMENT
NEUTRALIZATION & SOLIDIFICATION
COMMENTS: UPDATE OF GM86-1785
TYPE OF CONTAINER : Metal drums barrels kegs

WASTE ANALYSIS INFORMATION

WASTE PROFILE SHEET # 3233
WASTE NAME : ACID RINSE WATER
ODOR : MILD
COLOR : GREEN
PHYSICAL STATE : LIQUID

Specific Gravity : 1.0%
pH : 2.0
Normality : N/A
% Solids : 1.0
TLV Sniffer : <20
Flash Point : >140
Heating Value BTU/LB :
Heating Value BTU/GAL :
Hexavalent Chromium Cr :
Water Soluble :
Sulfides : NEG
Organic Chlorides : NEG
TOX : NEG
TOC :
Cyanides as CN Total mg/l :
Cyanides as CN Free mg/l : NEG
PCBs :
TOX Leachate : N/A
Free Liquids : POS

PROCESS PRODUCING WASTE : METAL PLATING SHOP

APPROVAL JLC DATE 9/24/87 DENIAL _____ DATE _____
APPROVAL _____ DATE _____ DENIAL _____ DATE _____

9/26

U.S. POLLUTION CONTROL, INC.

GRASSY MOUNTAIN FACILITY
WASTE ANALYSIS
SAMPLE SHEET

ANALYST D. Rees

GM8 7-2741 WASTE PROFILE SHEET # 3233 BROKER #

DATE RECEIVED 9/17/87 GENERATOR Lawrence Livermore National Lab

DATE OF ANALYSIS 9/17/87 WASTE NAME acid rinse water

****

mild ODOR	HEATING VALUE BTU/lb
green COLOR	HEATING VALUE BTU/gal
PHYSICAL STATE: LIQUID (X) SOLID ( ) SLUDGE ( )	HEX CHROMIUM mg/l
pos FREE LIQUIDS	WATER SOLUBLE
2.6 FLYASH FACTOR	neg SULFIDES
1.02 SPEC. GRAVITY	neg TOX
2.0 PH	TOX LEACHATE
NORMALITY	TOC
10 % SOLIDS	neg CYANIDES as CN FREE mg/l
<20 TLV SNIFFER	CYANIDES as CN TOTAL mg/l
>140 FLASH POINT	PCB's ppm
ASH CONTENT ON IGNITION	

****

SALES REP: TYPE OF CONTAINER: DM 55 TT

COMMENTS: profile update of G-MB6-1785

BILLING:
STANDARD ( ) RUSH ( ) ON ARRIVAL/EMERGENCY ( )
SM QTY GEN ( ) LAB PACK ( ) NONE (X)

OUTSIDE LAB ANALYSIS:

TREATMENT: acceptable
NEURTALIZATION (X) SOLIDIFICATION ( ) CHROMATE REDUCTION ( )
ENCAPSULATION ( ) SOLVENT RECOVERY ( ) BOILER FUELS ( )
OTHER:

LAB ACCEPTANCE [signature] DATE 9/21/87 LAB DENIAL DATE

5662 South 300 West • Murray, UT 84107 • 801/266-3908

U.S. POLLUTION CONTROL, INC.

Special Services

HAZARDOUS WASTE PROFILE SHEET

3233

EXHIBIT A TO _____ Contract Dated _____

As prescribed by the Resource Conservation and Recovery Act (Public Law 98-580 Sec. 3004), a detailed chemical and physical analysis must be submitted before we can handle your waste stream. This information is necessary to help us evaluate whether we can safely and economically transport and dispose of your controlled industrial wastes in an environmentally sound manner. Be as complete as possible. If an area is not applicable, mark as such. Should a laboratory analysis be available, please attach it to this form. We can arrange analytical laboratory services, if neded, for an appropriate fee. All information we receive will be held in strictest confidence to protect your interests. **SAMPLE WILL NOT BE PROCESSED UNLESS ALL AREAS OF THIS SHEET ARE PROPERLY FILLED IN.** A fee of _____ will be charged for processing this sample.

Cm86-1795 Sales Representative _____

I. Generator Information ( ) Check if small quantity Generator per CFR-40

Name of Company Lawrence Livermore National Lab US EPA ID CA2890012584

Facility Address 7000 East Ave, Livermore Ca. Mailing Address P.O. BOX 5505, L-620

Livermore Ca 94550

Bill to: M P Vacuum Truck Service

Technical Contact Mike Hayes Title Shipping Coordinator Phone (415) 422-1925

General Contact Edward R. Taylor Title Operations Manager Phone ( ) _____

II. Waste Stream General Information

Waste Name Acid rinse Water ANTICIPATED VOLUME 50,000 gal per year X

Process Producing Waste Metal plating shop per month _____ per week _____ one time only _____

Color _____ Odor _____

III. Waste Properties

Physical State @ 25°C: (X) Liquid ( ) Powder ( ) Solid ( ) Sludge

Layers: (X) Single Phase ( ) Bi-layered ( ) Multi-layered

Free Liquids: (X) Yes ( ) No

pH 1-2 Normality .01-1 Type Acid _____ Type _____ Density 1.1 Caustic _____

( ) Organic (X) Inorganic Flash Point >200 °F

Chemical Composition (X)% ( ) PPM

(List all known)	Range Lower	Upper
Hydrochloric Acid	(.01)	(.1)
Sulfuric Acid	(.01)	(.1)
Phosphoric Acid	(.01)	(.1)
~~Nickle~~	~~(.01)~~	~~(.1)~~
Nitric Acid	(.01)	(.1)
Alodine	(.01)	(.1)
Water	99.9 ~~99.9~~	99.98

Metals-EP Tox Test / Mg/l or PPM

Arsenic (As)	(0)	Lead (Pb)	(0)	Nickel (Ni)	(1750)
Barium (Ba)	(0)	Vanadium (V)	(0)	Zinc (Zn)	(250)
Cadmium (Cd)	(250)	Selinium (Se)	(0)	Thallium (Ti)	(0)
Chromium (Cr)	2000 ~~750~~	Silver (Ag)	(250)	Cobalt (Co)	(0)
Mercury (Hg)	(0)	Cooper (Cu)	(750)		

Possible Component (include unit of measure)

Cyanides Ø 2, 4, D Ø Dioxin Ø

Sulfides Ø Phenolics Ø Organic Chlorides Ø

IV. PCB Oil: Type N/A Concentration _____ % ppm _____ PCB Equip: Type _____ Concentration _____ % ppm _____

PCB Solids: Type _____ Concentration _____ % ppm _____ Has equipment been drained and flushed according to 40 CFR Part 761? ___

Attach information for dimensions, weight and nameplate capacity for all equipment.

V. Hazardous Characteristics (From CFR-40)

U.S. EPA Hazardous Code(s) F006, D006, D007, ~~D008~~ D011

Is the waste ( ) Pyrophoric ( ) Infectious ( ) Water reactive ( ) Radioactive ( ) Pathogenic

( ) Explosive ( ) Pesticides/Herbicides ( ) Biological ( ) Shock sensitive ( ) Etological

VI. Shipping Information (From CFR-40)

Proper DOT Shipping Name Waste Acid liquid, n.o.s.

DOT Hazard Class Corrosive Material UN/NA Number NA 1760 Reportable Quantity 100

Method of Shipment (X) Bulk Liquids ( ) Bulk Solids ( ) Drums ( ) Other

Special Handling and Safety Instructions Wear Protective clothing

The samples have been collected using the appropriate EPA sampling guidelines

I certify and warrant that the above information, the information attached, and the waste stream as described is true and correct to the best of my knowledge and ability and not willful or deliberate omissions exist and that all known and/or suspected hazards have been disclosed, and a sample representative of the waste stream has been or is being sent to the proper facility.

Signature _____ Title Shipping Coordinator Date 12-10-86

ATTACHMENT A

SAMPLE UPDATE REQUIRMENTS

GENERATOR Lawrence Livermore National Laboratory EPA ID # CA2890012584

ADDRESS P.O. Box 5505, L-620

CITY Livermore STATE Ca ZIP 94550

DISTRIBUTION DATE: 8-20-87

MARKETING REPRESENTATIVE: _____ BROKER _____

WASTESTREAM NAME	SAMPLE REFERENCE #	PROFILE REQUIRED	CERT. REQUIRED
coolant/wash waters	GM86-1903		
acid rinse water	GM86-1785		
Asbestos	GM86-1770		
solvent contaminated rinse water	GM86-1766		
soils w/ metal contamination	GM86-1768		
caustic rinse water	GM86-1751		
chemical contaminated pallets	GM86-1964		
Non-PCB Electronical Equipment	GM86-1733		
chromic & sulfuric acid	GM86-1672		
Laser dye wash water	GM86-1671		
~~waste flammable ethers~~	~~GM86-1670~~		
sulfamic acid potassium dichromate	GM86-1649		
treated H20 w/Cr & NI	GM86-1374		
Non-PCB Transformer	GM86-1345		

U.S. POLLUTION CONTROL, INC.

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COMPLETED

CUSTOMER SAMPLE REFERENCE NUMBER : GM86-1785

GENERATOR	BROKER
LAWRENCE LIVERMORE NATIONAL LABORATORY	Special Services
7000 EAST AVE	10220 W. Reno
LIVERMORE CA 94550	Oklahoma City OK 73127
CONTACT : MICHAEL N. HYNES	CONTACT: Charles Soukup
TELEPHONE : 415-422/0398	405-324/33

ANALYST NAME : LON GRIFFITH
SALES REP: SPECIAL SERVICES
SAMPLE ARRIVAL DATE : 12/13/86
PROFILE ARRIVAL DATE : 12/13/86
CUSTOMER SAMPLE # : GM86-1785
SAMPLE SITE : LIVERMORE/CALIF
DATE COMPLETED : 12/13/86

ACCEPTANCE/DENIAL INFORMATION

ACCEPTABLE FOR DISPOSAL WITH THE FOLLOWING TREATMENT – Neutralization and SOLIDIFICATION
COMMENTS:
TYPE OF CONTAINER : Cargo tanks (tank trucks)

WASTE ANALYSIS INFORMATION

WASTE PROFILE SHEET # 323
WASTE NAME : ACID RINSE WATER
ODOR : MILD
COLOR : GREEN
PHYSICAL STATE : LIQUID
Specific Gravity : 1.02
pH : 2.0
Normality :
% Solids : 1
TLV Sniffer : <20
Flash Point : >140
Heating Value BTU/LB :
Heating Value BTU/GAL :
Hexavalent Chromium Cr :
Water Soluble :
Sulfides : NEG
Organic Chlorides : NEG
TOX : NEG
TOC :
Cyanides as CN Total mg/l :
Cyanides as CN Free mg/l : NEG
PCBs :
TOX Leachate :
Free Liquids :
PROCESS PRODUCING WASTE : METAL PLATING SHOP

APPROVAL [signature] DATE 12/22/86 DENIAL _____ DATE _____
APPROVAL [signature] DATE 12-22-86 DENIAL _____ DATE _____

12/23

U. S. P. C. I.
GRASSY MOUNTAIN FACILITY
WASTE ANALYSIS/SAMPLE SHEET

GM86-1785 WASTE PROFILE SHEET # 323

DATE RECEIVED 12-13-86 GENERATOR NAME: Lawrence Livermoore

DATE OF ANALYSIS 12-13-86 WASTE NAME: Acid Rinse Water

****

Mold	ODOR		PCB's
Green	COLOR		ARSENIC as AS mg/1
Liquid	PHYSICAL STATE		SILVER as AG mg/1
POS	FREE LIQUIDS		CADMIUM as CD mg/1
2.6	FLYASH FACTOR		CHROMIUM toatl as CR mg/1
1.02	SPECIFIC GRAVITY		COBOLT
2.0	PH		COPPER as CU mg/1
	NORMALITY		MERCURY as HG mg/1
1	% SOLIDS		LEAD as PB mg/1
<20	TLV SNIFFER		NICKEL as NI mg/1
>140	FLASH POINT		SELENIUM as SE mg/1
	ASH CONTENT ON IGNITION		ZINC as ZN mg/1
	HEATING VALUE BTU/11b		BARIUM as mg/1
	HEATING VALUE BTU/gal		OIL & GREASE mg/1
	HEXAVALENT CHROMIUM Cr mg/1		NITROGEN
	WATER SOLUBLE		PHOPHORUS
N	SULFIDES		AROMATICS
N	TOX		ALAPHATICS
	TOX LEACHATE		ASPHALTEENS
	TOC		PARAFINES
N	CYANIDES as CN Free mg/1		VANADIUM
	CYANIDES as CN total mg/1	ANALYST	Tom Coffee

****

SALES REPRESENTATIVE Special Services MODE OF SHIPMENT Tanker

COMMENTS: (OTHER)

BILLING: STANDARD RUSH (ON ARRIVAL(EMERGENCY)) THIRD PARTY TOX

(ACCEPTABLE) / NOT ACCEPTABLE:

TREATMENT: ___NEUTRALIZATION ✓SOLIDIFICATION ___CHROMATE REDUCTION ___ENCAPSULATION

___ SOLVENT RECOVERY ___ BOILER FUELS ___ OTHER:

U.S. POLLUTION CONTROL, INC.

SAMPLE UPDATE CERTIFICATION

GENERATOR: Lawrence Livermore Nat'l. Lab. EPA ID # CA2890012584

ADDRESS: PO Box 5505, L-620

CITY Livermore ~~CA~~ STATE CA ZIP 94550

U.S.P.C.I. ~~SAMPLE~~ REFERENCE NUMBER See Attachment A date 8-20-87

WASTESTREAM NAME various

I HEREBY CERTIFY THE CHEMICAL AND PHYSICAL CHARACTERISTICS AS WELL AS THE PROCESS GENERATING THE ABOVE NAMED WASTESTREAMS HAS NOT CHANGED DURING THE PAST YEAR.

Michael R. Hayes

GENERATOR (AUTHORIZED SIGNATURE)

Shipping Supervisor

TITLE

9-7-87

DATE

RECORD NUMBER 9513 LOGGED BY JT LOAD LOG DATE: 12/13

4TH WC D011

GENERATOR LAWRENCE LIVERMORE NATIONAL LABORATORY
ADDRESS 7000 EAST AVE/P.O. BOX 550E ACCEPTANCE CODE CM96-1785
CITY ST LIVERMORE, CA
ZIP 94550
TELEPHONE 415/423-0990

SAMPLE#	LOAD TICKET#	LOAD#	MANIFEST#	EPA ID#	EPA WC1	EPA WC2	EPA WC3	HAULER	QUANTITY		TOTAL POUNDS
4927	02885	4927	70031	CA2890012584	F006	D006	D007	CAT000624247	3937	G	33450

% SOLID	S.G.	PH	NORM	SNIFF	FLASH	TOX	TOC	FREE LIQUIDS	HAND/CODES	PHYSICAL APPEARANCE	LBS--THIS AR
1	1.02	2		<20	>140	NEG		POS/T47/NEG	T47/D80	GREEN LIQUID	334

DISP/AREA	DISP/DATE	SECTION	LAYER	ROW	DRUM THRU DRUM	ROW TO ROW	ROW TO ROW	ROW TO ROW	TRUCK T
S2	12/13	H7							T

DESCRIPTION---WASTE ACID RINSE WATER PROCESS---

RECORD NUMBER 9516 LOGGED BY JT LOAD LOG DATE: 12/13

GENERATOR PUBLIC SERVICE COMPANY OF CO.
ADDRESS 6198 FRANKLIN ACCEPTANCE CODE
CITY ST DENVER, CO
ZIP 80216
TELEPHONE 303/286-6221

SAMPLE#	LOAD TICKET#	LOAD#	MANIFEST#	EPA ID#	EPA WC1	EPA WC2	EPA WC3	HAULER	QUANTITY		TOTAL POUNDS
4928	02651	4928	12097	COD980296017	D009	NONE	NONE	OKD981514474	7	D	958

% SOLID	S.G.	PH	NORM	SNIFF	FLASH	TOX	TOC	FREE LIQUIDS	HAND/CODES	PHYSICAL APPEARANCE	LBS--THIS AR
0									/		0

DISP/AREA	DISP/DATE	SECTION	LAYER	ROW	DRUM THRU DRUM	ROW TO ROW	ROW TO ROW	ROW TO ROW	TRUCK T
									V

DESCRIPTION---MIXED DRUMS PROCESS---

RECORD NUMBER 9517 LOGGED BY JT LOAD LOG DATE: 12/1

GENERATOR TIMPTE INDUSTRIES INC.
ADDRESS 5990 NORTH WASHINGTON STREET ACCEPTANCE CODE
CITY ST DENVER, CO
ZIP 80216
TELEPHONE 303/290-3360

MANIFEST#	EPA ID#	EPA WC1	EPA WC2	EPA WC3	HAULER	QUANTITY	TOTAL POUNDS

U.S. POLLUTION CONTROL, INC.

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CUSTOMER SAMPLE REFERENCE NUMBER : GM87-2750

GENERATOR

LAWRENCE LIVERMORE NAT'L. LAB.
PO BOX 5505 L-620
LIVERMORE CA 94550
ATTENTION : MICHAEL J. HAYES
PLEASE FORWARD TO ENVIRONMENTAL DEPT.!

BROKER

Special Services
10220 W. Reno
Oklahoma City OK 73127
CONTACT: LARRY LABAR
405-324/33

ANALYST NAME : D REES
SALES REP: SPECIAL SERVICES
SAMPLE ARRIVAL DATE : 09/17/87
PROFILE ARRIVAL DATE : 09/17/87

CUSTOMER SAMPLE # : GM87-2750
SAMPLE SITE : LIVERMORE/CALIF
DATE COMPLETED : 09/17/87

ACCEPTANCE/DENIAL INFORMATION

ACCEPTABLE FOR DISPOSAL WITH THE FOLLOWING TREATMENT
SOLIDIFICATION
COMMENTS: UPDATE OF GM86-1669
TYPE OF CONTAINER : Cargo tanks (tank trucks)

WASTE ANALYSIS INFORMATION

WASTE PROFILE SHEET # 0629
WASTE NAME : SULFAMIC ACID/POTASSIUM DICHRO
ODOR : NONE
COLOR : ORANGE
PHYSICAL STATE : LIQUID

Specific Gravity : 1.05
pH : 1.2
Normality : 0.48
% Solids : 1.0
TLV Sniffer : <20
Flash Point : >140
Heating Value BTU/LB :
Heating Value BTU/GAL :
Hexavalent Chromium Cr :
Water Soluble :
Sulfides : NEG
Organic Chlorides : NEG
TOX : NEG
TOC :
Cyanides as CN Total mg/l :
Cyanides as CN Free mg/l : NEG
PCBs :
TOX Leachate : N/A
Free Liquids : POS

PROCESS PRODUCING WASTE : PHOTO PROCESS

APPROVAL AEC DATE 9/24/87 DENIAL _____ DATE _____
APPROVAL _____ DATE _____ DENIAL _____ DATE _____

9/22

U.S. POLLUTION CONTROL, INC.

GRASSY MOUNTAIN FACILITY
WASTE ANALYSIS
SAMPLE SHEET

ANALYST D. Rees

GM8 7-2750 WASTE PROFILE SHEET # 0629 BROKER # _____

DATE RECEIVED 9/17/87 GENERATOR Lawrence Livermore National Lab

DATE OF ANALYSIS 9/17/87 WASTE NAME Sulfamic acid & potassium dichromate

****

None ODOR

Orange COLOR

PHYSICAL STATE:
LIQUID (X) SOLID ( ) SLUDGE ( )

Pas FREE LIQUIDS

3.6 FLYASH FACTOR

1.05 SPEC. GRAVITY

1.2 PH

0.48 NORMALITY

1.0 % SOLIDS

<20 TLV SNIFFER

>140 FLASH POINT

_____ ASH CONTENT ON IGNITION

_____ HEATING VALUE BTU/lb

_____ HEATING VALUE BTU/gal

_____ HEX CHROMIUM mg/l

_____ WATER SOLUBLE

Neg SULFIDES

Neg TOX

_____ TOX LEACHATE

_____ TOC

Neg CYANIDES as CN FREE mg/l

_____ CYANIDES as CN TOTAL mg/l

_____ PCB's ppm

****

SALES REP: _____ TYPE OF CONTAINER: TT

COMMENTS: profile update of G-M86-1669

BILLING:
STANDARD ( ) RUSH ( ) ON ARRIVAL/EMERGENCY ( )
SM QTY GEN ( ) LAB PACK ( ) NONE (X)

OUTSIDE LAB ANALYSIS: _____

TREATMENT: acceptable
NEURTALIZATION ( ) SOLIDIFICATION (X) CHROMATE REDUCTION ( )
ENCAPSULATION ( ) SOLVENT RECOVERY ( ) BOILER FUELS ( )
OTHER: _____

LAB ACCEPTANCE [signature] DATE 9/18/87 LAB DENIAL _____ DATE _____

5662 South 300 West • Murray, UT 84107 • 801/266-3908

U.S.
POLLUTION
CONTROL, INC.

SAMPLE UPDATE CERTIFICATION

GENERATOR: Lawrence Livermore Nat'l. Lab. EPA ID # CA2890012584

ADDRESS: PO Box 5505, L-620

CITY Livermore CA STATE CA ZIP 94550

U.S.P.C.I. SAMPLE REFERENCE NUMBER See Attachment A date 8-20-87

WASTESTREAM NAME various

I HEREBY CERTIFY THE CHEMICAL AND PHYSICAL CHARACTERISTICS AS WELL AS THE PROCESS GENERATING THE ABOVE NAMED WASTESTREAMS HAS NOT CHANGED DURING THE PAST YEAR.

Michael R. Hayes

GENERATOR (AUTHORIZED SIGNATURE)

Shipping Supervisor

TITLE

9-7-87

DATE

ATTACHMENT A

SAMPLE UPDATE REQUIRMENTS

GENERATOR Lawrence Livermore National laboratory **EPA ID #** CA2890012584

ADDRESS P.O. Box 5505, L-620

CITY Livermore **STATE** Ca **ZIP** 94550

DISTRIBUTION DATE: 8-20-87

MARKETING REPRESENTATIVE: **BROKER**

WASTESTREAM NAME	SAMPLE REFERENCE #	PROFILE REQUIRED	CERT. REQUIRED
coolant/wash waters	GM86-1903		
acid rinse water	GM86-1785		
Asbestos	GM86-1770		
solvent contaminated rinse water	GM86-1766		
soils w/ metal contamination	GM86-1768		
caustic rinse water	GM86-1751		
chemical contaminated pallets	GM86-1964		
Non-PCB Electronical Equipment	GM86-1733		
chromic & sulfuric acid	GM86-1672		
Laser dye wash water	GM86-1671		
~~methanol~~	~~GM86-1676~~		
sulfamic acid & potassium dichromate	GM86-1669		
Treated H2O w/Cr & NI	GM86-1374		
Non-PCB Transformer	GM86-1345		

U.S. POLLUTION CONTROL, INC.

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CUSTOMER SAMPLE REFERENCE NUMBER : GM86-1669
GENERATOR BROKER

LAWRENCE LIVERMORE NATIONAL LABORATORY [redacted] BROKER FOR THIS SAMPLE
7000 EAST AVE Special Services
LIVERMORE CA 94550
CONTACT : MICHAEL N. HYNES
TELEPHONE : 415-422/0398

ANALYST NAME : TIM LAVER
SALES REP: CUSTOMER SAMPLE # : GM86-1669
SAMPLE ARRIVAL DATE : 11/25/86 SAMPLE SITE : LIVERMORE CALIF
PROFILE ARRIVAL DATE : 11/25/86 DATE COMPLETED : 11/25/86

ACCEPTANCE/DENIAL INFORMATION

ACCEPTABLE FOR DISPOSAL WITH THE FOLLOWING TREATMENT - neutralization and SOLIDIFICATION

COMMENTS:
TYPE OF CONTAINER : Cargo tanks (tank trucks)

WASTE ANALYSIS INFORMATION

WASTE PROFILE SHEET # 0629
WASTE NAME : ~~SULFURIC~~ Sulfamic ACID & POTTASSIUM DIC
ODOR : NONE COLOR : ORANGE
PHYSICAL STATE : LIQUID

Specific Gravity : 1.05
pH : 1.2
Normality : 0.48
% Solids : 1.0
TLV Sniffer : <20
Flash Point : >140
Heating Value BTU/LB :
Heating Value BTU/GAL :
Hexavalent Chromium Cr :
Water Soluble :
Sulfides : NEG
Organic Chlorides : NEG
TOX : NEG
TOC :
Cyanides as CN Total mg/l :
Cyanides as CN Free mg/l : NEG
PCBs :
TOX Leachate : 1.0
Free Liquids :

PROCESS PRODUCING WASTE : PHOTO PROCESS

APPROVAL [signature] DATE 11/25/86 DENIAL _____ DATE _____
APPROVAL [signature] DATE 12-4-86 DENIAL _____ DATE _____

U. S. P. C. I.
GRASSY MOUNTAIN FACILITY
WASTE ANALYSIS/SAMPLE SHEET

GMS 6-1649 WASTE PROFILE SHEET # 0629

DATE RECEIVED 11-25-86 GENERATOR NAME: Lawrence Livermore National Lab

DATE OF ANALYSIS 11-25-86 WASTE NAME: _____

****

none	ODOR		PCB's
orange	COLOR		ARSENIC as AS mg/1
liquid	PHYSICAL STATE		SILVER as AG mg/1
pos.	FREE LIQUIDS		CADMIUM as CD mg/1
3.6	FLYASH FACTOR		CHROMIUM toatl as CR mg/1
1.05	SPECIFIC GRAVITY		COBOLT
1.2	PH		COPPER as CU mg/1
0.48	NORMALITY		MERCURY as HG mg/1
1.0	% SOLIDS		LEAD as PB mg/1
420	TLV SNIFFER		NICKEL as NI mg/1
7110	FLASH POINT		SELENIUM as SE mg/1
	ASH CONTENT ON IGNITION		ZINC as ZN mg/1
	HEATING VALUE BTU/11b		BARIUM as mg/1
	HEATING VALUE BTU/gal		OIL & GREASE mg/1
	HEXAVALENT CHROMIUM Cr mg/1		NITROGEN
	WATER SOLUBLE		PHOPHORUS
Neg.	SULFIDES		AROMATICS
Neg.	TOX		ALAPHATICS
	TOX LEACHATE		ASPHALTEENS
	TOC		PARAFINES
Neg.	CYANIDES as CN Free mg/1		VANADIUM
	CYANIDES as CN total mg/1	ANALYST	T. LAVOR

****

SALES REPRESENTATIVE _____ MODE OF SHIPMENT TT

COMMENTS: (OTHER) _____

BILLING: STANDARD RUSH ON ARRIVAL(EMERGENCY) THIRD PARTY TOX

ACCEPTABLE / NOT ACCEPTABLE: _____

TREATMENT: ___NEUTRALIZATION ___SOLIDIFICATION ___CHROMATE REDUCTION ___ENCAPSULATION
SOLVENT RECOVERY BOILER FUELS OTHER:

MATERIAL SAFETY DATA SHEET

EASTMAN KODAK COMPANY
343 State Street
Rochester, New York 14650

For Emergency Health, Safety, and Environmental Information, call (716) 722-5151
For all other purposes, call the Marketing and Distribution Center in your area.

Revised Date of Preparation: 10/7/83 Approved by U.S. Department of Labor

SECTION I. IDENTIFICATION

- Product Name: KODAK Microfilm Bleach and Replenisher
- Formula: Aqueous Mixture
- Kodak Photographic Chemicals Catalog Number(s): CAT 190 1701 - 50 Gallons; CAT 180 3972 - 5 Gallons
- Solution Number: 3979
- Kodak Accession Number: 355076

SECTION II. PRODUCT AND COMPONENT HAZARD DATA

A. COMPONENT(S):

	Percent	TLV*	Kodak Accession No.	CAS Reg. No.
Water	75-80	---	035290	7732-18-5
*Sulfamic acid	15-20	---	904659	5329-14-6
*Potassium dichromate	5-10	0.05 mg/m^3 (as Cr)	902547	7778-50-9

[*Principal Hazardous Component(s)]

B. PRECAUTIONARY LABEL STATEMENT(S):

Contains Sulfamic acid and potassium dichromate
WARNING! Causes burns.
May cause allergic skin reaction.
Avoid contact with eyes, skin, and clothing.
In case of contact, flush skin or eyes with plenty of water for 15 minutes; for eyes, get medical attention.

CAL

This is The one we Are Collecting FOR DISPOSAL.

JON BIRTS

B-0007.500D
82-0003

SECTION III. PHYSICAL DATA

- Appearance and Odor: Reddish brown solution; odorless
- Boiling Point: > 100 °C (> 212 °F) @ 760 mmHg
- Vapor Pressure: ∿ 18 mmHg @ 20 °C
- Vapor Density (Air = 1): ∿ 0.6
- Evaporation Rate (n-butyl acetate = 1): Not Available
- Volatile Fraction by Weight: ∿ 80 %
- Specific Gravity (H_2O = 1): 1.14
- pH: <1.0
- Solubility in Water (by Weight): Complete

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

- Flash Point: None
- Extinguishing Media: Not Applicable
- Special Fire Fighting Procedures: None
- Unusual Fire and Explosion Hazards: None

SECTION V. REACTIVITY DATA

- Stability: Stable
- Incompatibility: Alkali
- Hazardous Decomposition Products: Ammonia
- Hazardous Polymerization: Will not occur.

SECTION VI. TOXICITY AND HEALTH HAZARD DATA

A. THRESHOLD LIMIT VALUE: See Section II

B. EXPOSURE EFFECTS:

Eyes: Causes eye burns.

Skin: Causes burns.
Repeated skin contact may result in an allergic skin reaction.

C. FIRST AID:

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes and get medical attention.

Skin: Immediately flush skin with plenty of water for at least 15 minutes and get medical attention if symptoms are present after washing.
Remove contaminated clothing and shoes.
Launder contaminated clothing before reuse.

SECTION XI. TRANSPORTATION

Transportation information may be obtained by requesting an EXTERNAL TRANSPORTATION ADDENDUM sheet by catalog number(s) from Kodak Publications Data Services, Eastman Kodak Company, 343 State Street, Rochester, New York 14650.

SECTION XII. REFERENCES

1. Unpublished Data. Health, Safety, and Human Factors Laboratory. Eastman Kodak Company, Rochester, New York.

2. Battelle's Columbus Laboratories, Water Quality Critical Data Book - Vol. 3 - Effects of Chemicals on Aquatic Life - Selected Data from the Literature Through 1968, for the U.S. Environmental Protection Agency, Project No. 18050 GWV, Contract No. 68-01-007, May 1971.

3. Kodak Publication J-41, BOD_5 and COD of Photographic Chemicals, Eastman Kodak Co., 1981.

4. McKee, J.E. and Wolf, H.W., Eds., "Water Quality Criteria," State of California, Publication No. 3-A, 1963.

Special Services GMB6-16690629

U.S. POLLUTION CONTROL, INC.

HAZARDOUS WASTE PROFILE SHEET

EXHIBIT A TO _____ Contract Dated _____

As prescribed by the Resource Conservation and Recovery Act (Public Law 98-580 Sec. 3004), a detailed chemical and physical analysis must be submitted before we can handle your waste stream. This information is necessary to help us evaluate whether we can safely and economically transport and dispose of your controlled industrial wastes in an environmentally sound manner. Be as complete as possible. If an area is not applicable, mark as such. Should a laboratory analysis be available, please attach it to this form. We can arrange analytical laboratory services, if needed, for an appropriate fee. All information we receive will be held in strictest confidence to protect your interests. **SAMPLE WILL NOT BE PROCESSED UNLESS ALL AREAS OF THIS SHEET ARE PROPERLY FILLED IN.** A fee of _____ will be charged for processing this sample.

Sales Representative _____

I. Generator Information

( ) Check if small quantity Generator per CFR-40

Name of Company Lawrence Livermore National Lab. US EPA ID CAZ890012558

Facility Address 7000 East Ave Livermore Ca 94550

Mailing Address PO Box 5505 L-620 Livermore Ca. 94550

Technical Contact Mike Hayes Title Shipping Coord. Phone (415) 422-1925

General Contact Ed F. Taylor Title Ops. Mgr. Phone (415) 423-0398

II. Waste Stream General Information

ANTICIPATED VOLUME 5000 g per year X per month _____ per week _____ one time only _____

Waste Name Sulfamic Acid + Potassium Dichromate

Process Producing Waste ~~Plating~~ Photo process Color Dark orange Odor None

III. Waste Properties

Physical State @ 25°C: (X) Liquid ( ) Powder ( ) Solid ( ) Sludge

Layers: (X) Single Phase ( ) Bi-layered ( ) Multi-layered

Free Liquids: (X) Yes ( ) No

pH 0.9 Normality 0.1 - 1.0

Type Acid Sulfamic Type _____

Density SG 1.14 Caustic _____

( ) Organic (X) Inorganic

Flash Point _____ °F

Chemical Composition ( )% ( ) PPM (List all known)

	Range Lower	Upper
Sulfamic Acid	15	20
Potass. dichromate	5	10
Hex-Chrome	0.05	1
Water	50	70
_____	( )	( )
_____	( )	( )
_____	( )	( )

Metals-EP Tox Test — Mg/l or (PPM)

Arsenic (As)	(0)	Lead (Pb)	(0)	Nickel (Ni)	(1.1)
Barium (Ba)	(0)	Vanadium (V)	(0)	Zinc (Zn)	(3.1)
Cadmium (Cd)	(0)	Selinium (Se)	(0)	Thallium (Ti)	(0)
Chromium (Cr)	(—)	Silver (Ag)	(0)	Cobalt (Co)	(0)
Mercury (Hg)	(0)	Cooper (Cu)	(0.24)	Hex-Chrome	8300

Possible Component (include unit of measure)

Cyanides 0 2, 4, D _____ Dioxin _____

Sulfides 0 Phenolics _____ Organic Chlorides _____

IV. PCB Oil: Type 0 Concentration _____ % ppm _____ PCB Equip: Type _____ Concentration _____ % ppm _____

PCB Solids: Type 0 Concentration _____ % ppm _____ Has equipment been drained and flushed according to 40 CFR Part 761? _____

Attach information for dimensions, weight and nameplate capacity for all equipment.

V. Hazardous Characteristics (From CFR-40)

U.S. EPA Hazardous Code(s) D002, D007

Is the waste ( ) Pyrophoric ( ) Infectious ( ) Water reactive ( ) Radioactive ( ) Pathogenic ( ) Explosive ( ) Pesticides/Herbicides ( ) Biological ( ) Shock sensitive ( ) Etological

VI. Shipping Information (From CFR-40)

Proper DOT Shipping Name WASTE ACID, LIQUID, N.O.S.

DOT Hazard Class Corrosive material UN/(NA) Number NA 1760 Reportable Quantity 0

Method of Shipment (X) Bulk Liquids ( ) Bulk Solids ( ) Drums ( ) Other

Special Handling and Safety Instructions protective clothing - Boots - Gloves.

The samples have been collected using the appropriate EPA sampling guidelines

I certify and warrant that the above information, the information attached, and the waste stream as described is true and correct to the best of my knowledge and ability and not willful or deliberate omissions exist and that all known and/or suspected hazards have been disclosed, and a sample representative of the waste stream has been or is being sent to the proper facility.

_____ Shipping Coordinator 4-21-86

SECTION VII. PERSONAL PROTECTION AND CONTROLS

A. RESPIRATORY PROTECTION: None should be needed.

B. VENTILATION:

Local Exhaust: None should be needed.

Mechanical (General): Recommended

C. SKIN AND EYE PROTECTION:

Protective gloves should be worn.
Safety glasses with side shields or goggles are recommended.

SECTION VIII. SPECIAL STORAGE AND HANDLING PRECAUTIONS

Avoid contact with alkali.

SECTION IX. SPILL, LEAK, AND DISPOSAL PROCEDURES

Wear suitable protective equipment.
Neutralize with sodium carbonate.
Small amount - flush material to sewer with large amounts of water.
Large amount - absorb material in vermiculite or other suitable absorbent and place in impervious container.
Contract with licensed chemical waste disposal service.
Discharge, treatment, or disposal may be subject to federal, state, or local laws.

SECTION X. ENVIRONMENTAL EFFECTS DATA

A. SUMMARY:

This chemical formulation has not been tested for environmental effects. Some laboratory test data and published data are available for the major components of this chemical formulation, and these data have been used to provide the following estimate of environmental impact:[1,2,3,4]

This chemical formulation is a strongly acidic aqueous solution. This chemical formulation has a low biological oxygen demand, and it is expected to cause little oxygen depletion in aquatic syatems. It is expected to have a high potential to affect aquatic organisms, secondary waste treatment microorganisms, and the germination and growth of some plants. The components of this chemical formulation are not likely to bioconcentrate. The direct instantaneous discharge to a receiving body of water of an amount of this chemical formulation which will rapidly produce, by dilution, a final concentration of 0.002 mg/L or less as chromium is not expected to cause an adverse environmental effect.

DISP/AREA	DISP/DATE	SECTION	LAYER	ROW	DRUM THRU DRUM	ROW TO ROW	ROW TO ROW	ROW TO ROW	TRUCK TY
IN1	11/25								DT

DESCRIPTION---CRUSHED DRUMS & CONTAMINATED D PROCESS---

****

RECORD NUMBER 8662 LOGGED BY DR LOAD LOG DATE: 11/25/

GENERATOR PEABODY COAL CO.
ADDRESS P.O. BOX 605 ACCEPTANCE CODE GM86-1267
CITY ST KAYENIA, AZ
ZIP 86033
TELEPHONE 602/774-5256

SAMPLE#	LOAD TICKET#	LOAD#	MANIFEST#	EPA ID#	EPA WC1	EPA WC2	EPA WC3	HAULER	QUANTITY		TOTAL POUNDS
4637	04665	4637	82-33	AZD104150024	D006	NONE	NONE	OKD045347093	16	Y	45570

% SOLID	S.G.	PH	NORM	SNIFF	FLASH	TOX	TOC	FREE LIQUIDS	HAND/CODES	PHYSICAL APPEARANCE	LBS--THIS ARE
87	1.72	7.0		<20	>140	NEG		NEG	D80/	BROWN SOLID	4557

DISP/AREA	DISP/DATE	SECTION	LAYER	ROW	DRUM THRU DRUM	ROW TO ROW	ROW TO ROW	ROW TO ROW	TRUCK TY
C1	11/25	E3							DT

DESCRIPTION---CONTAMINATED SOIL PROCESS---

****

RECORD NUMBER 8674 LOGGED BY DR LOAD LOG DATE: 11/25/
WC#4-F005 SENT TO HRI 11/25/86-MAN # PS8660

GENERATOR LAWRENCE LIVERMORE NATIONAL LABORATORY
ADDRESS 7000 EAST AVE/P.O. BOX 5505 ACCEPTANCE CODE GM86-1670
CITY ST LIVERMORE, CA
ZIP 94550
TELEPHONE 415/423-0398

SAMPLE#	LOAD TICKET#	LOAD#	MANIFEST#	EPA ID#	EPA WC1	EPA WC2	EPA WC3	HAULER	QUANTITY		TOTAL POUNDS
4638	04666	4638	70024	CA2890012584	F001	F002	F003	CAT000624247	1640	G	17760

% SOLID	S.G.	PH	NORM	SNIFF	FLASH	TOX	TOC	FREE LIQUIDS	HAND/CODES	PHYSICAL APPEARANCE	LBS--THIS ARE
5.9	1.3	5.5		4000	>140	NEG			S05/T63	BROWN LIQUID	1776

DISP/AREA	DISP/DATE	SECTION	LAYER	ROW	DRUM THRU DRUM	ROW TO ROW	ROW TO ROW	ROW TO ROW	TRUCK TY
SHP	11/25								T

DESCRIPTION---1-1-1-TIRCHLORORTHANE PROCESS---

HAZARDOUS WASTE PROFILE SHEET

6250

EXHIBIT A TO _____ Contract Dated _____

As prescribed by the Resource Conservation and Recovery Act (Public Law 98-580 Sec. 3004), a detailed chemical and physical analysis must be submitted before we can handle your waste stream. This information is necessary to help us evaluate whether we can safely and economically transport and dispose of your controlled industrial wastes in an environmentally sound manner. Be as complete as possible. If an area is not applicable, mark as such. Should a laboratory analysis be available, please attach it to this form. We can arrange analytical laboratory services, if neded, for an appropriate fee. All information we receive will be held in strictest confidence to protect your interests. SAMPLE WILL NOT BE PROCESSED UNLESS ALL AREAS OF THIS SHEET ARE PROPERLY FILLED IN. A fee of _____ will be charged for processing this sample.

GM87-2253

Sales Representative Chuck Haun

I. Generator Information

( ) Check if small quantity Generator per CFR-40

Name of Company Bay Area Environmental

US EPA ID CAT080014079

Facility Address 1125 Kensley St.
Richmond CA 94804

Mailing Address SAME

Technical Contact J. Dells

Title Prgrm Mgr Phone (408) 435 8580

General Contact _____

Title _____ Phone ( ) _____

II. Waste Stream General Information

Waste Name WASTE BLEACH

Process Producing Waste PLATING SHOPS

ANTICIPATED VOLUME 1000 gal per year ?

per month _____ per week _____ one time only _____

Color _____ Odor _____

III. Waste Properties

Physical State @ 25°C
(X) Liquid ( ) Powder
( ) Solid ( ) Sludge

Layers
(X) Single Phase
( ) Bi-layered
( ) Multi-layered

Free Liquids
(X) Yes
( ) No

pH 12.8 Normality 1.0
Type Acid _____ Type _____
Density 10.0 Caustic NaClOg

( ) Organic
(X) Inorganic
Flash Point
— °F

Chemical Composition (X)% ( ) PPM
(List all known)

	Range Lower	Upper
Bleach	(0)	(20)
Water	(80)	(100)
	( )	( )
NaOH	(0)	(2%)
	( )	( )
	( )	( )
	( )	( )

Metals-EP Tox Test — Mg/l or PPM

Arsenic (As)	(/)	Lead (Pb)	(/)	Nickel (Ni)	(/)
Barium (Ba)	(/)	Vanadium (V)	(/)	Zinc (Zn)	(/)
Cadmium (Cd)	(/)	Selinium (Se)	(/)	Thallium (Ti)	(/)
Chromium (Cr)	(/)	Silver (Ag)	(/)	Cobalt (Co)	(/)
Mercury (Hg)	(/)	Cooper (Cu)	(/)		

Possible Component (include unit of measure)

Cyanides	N/A	2, 4, D	N/A	Dioxin	N/A
Sulfides	N/A	Phenolics	N/A	Organic Chlorides	N/A

IV. PCB Oil: Type N/A Concentration ____ % ppm ____ PCB Equip: Type _____ Concentration ____ % ppm ____

PCB Solids: Type _____ Concentration ____ % ppm ____ Has equipment been drained and flushed according to 40 CFR Part 761? ____

Attach information for dimensions, weight and nameplate capacity for all equipment.

V. Hazardous Characteristics (From CFR-40)

U.S. EPA Hazardous Code(s) D002

Is the waste
( ) Pyrophoric ( ) Infectious ( ) Water reactive ( ) Radioactive ( ) Pathogenic
( ) Explosive ( ) Pesticides/Herbicides (X) Biological ( ) Shock sensitive ( ) Etiological

VI. Shipping Information (From CFR-40)

Proper DOT Shipping Name WASTE CORROSIVE LIQUID, D002, N.O.S.

DOT Hazard Class CORROSIVE MAT. UN/NA Number UN1760 Reportable Quantity 1000 lbs

Method of Shipment ( ) Bulk Liquids ( ) Bulk Solids
(X) Drums ( ) Other

Special Handling and Safety Instructions CAUTION: AVOID CONTACT USE PROTECTIVE GEAR WHEN HANDLING.

The samples have been collected using the appropriate EPA sampling guidelines

I certify and warrant that the above information, the information attached, and the waste stream as described is true and correct to the best of my knowledge

POLLUTION CONTROL, INC.

GRASSY MOUNTAIN FACILITY
WASTE ANALYSIS
SAMPLE SHEET

ANALYST Glenn Jorgensen

GM8 7 2253 WASTE PROFILE SHEET # 6250 BROKER #

DATE RECEIVED 08/26/87 GENERATOR Bay Area Environmental

DATE OF ANALYSIS 08/26/87 WASTE NAME Waste Bleach

****

ODOR	HEATING VALUE BTU/lb
Multi COLOR	HEATING VALUE BTU/gal
PHYSICAL STATE: LIQUID ( ) SOLID (X) SLUDGE ( )	HEX CHROMIUM mg/l
NEG FREE LIQUIDS	WATER SOLUBLE
N/A FLYASH FACTOR	SULFIDES
0.5 SPEC. GRAVITY	NEG TOX
7.0 PH	TOX LEACHATE
NA NORMALITY	TOC
100 % SOLIDS	CYANIDES as CN FREE mg/l
<20 TLV SNIFFER	CYANIDES as CN TOTAL mg/l
>140 FLASH POINT	PCB's ppm
ASH CONTENT ON IGNITION	

****

SALES REP: Mick Haun TYPE OF CONTAINER: DM

COMMENTS: Lab analysis doesn't support D002 waste code

BILLING:
STANDARD ( ) RUSH ( ) ON ARRIVAL/EMERGENCY (X)
SM QTY GEN ( ) LAB PACK ( ) NONE ( )

OUTSIDE LAB ANALYSIS:

TREATMENT: acceptable
NEURTALIZATION ( ) SOLIDIFICATION ( ) CHROMATE REDUCTION ( )
ENCAPSULATION ( ) SOLVENT RECOVERY ( ) BOILER FUELS ( )
OTHER:

LAB ACCEPTANCE GS DATE 9/12/87 LAB DENIAL ____ DATE ____

Liquid

U.S. POLLUTION CONTROL, INC

NOTICE !!
PLEASE RETAIN THESE DOCUMENTS
THIS IS THE ONLY COPY YOU WILL
RECEIVE !!

CUSTOMER SAMPLE REFERENCE NUMBER : GM87-2253

GENERATOR

BAY AREA ENVIRONMENTAL
1125 HENSLAY
RICHMOND CA 94801
ATTENTION : DAVID BURTON
PLEASE FORWARD TO ENVIRONMENTAL DEPT.!

BROKER

NO BROKER FOR THIS SAMPLE

ANALYST NAME : ERIN THORNTON
SALES REP: MICK HAUN
SAMPLE ARRIVAL DATE : 08-26-87
PROFILE ARRIVAL DATE : 08-26-87

CUSTOMER SAMPLE # : GM87-2253
SAMPLE SITE : RICHMOND CA
DATE COMPLETED : 08-26-87

ACCEPTANCE/DENIAL INFORMATION

ACCEPTABLE FOR DISPOSAL AT THIS FACILITY
COMMENTS: LAB ANALYSIS DOESNT SUPPORT D002 WASTE CODE
TYPE OF CONTAINER : Metal drums barrels kegs

WASTE ANALYSIS INFORMATION

WASTE PROFILE SHEET # 6250
WASTE NAME : WASTE BLEACH
ODOR : NONE
COLOR : MULTI
PHYSICAL STATE : SOLID

Specific Gravity : 0.5
pH : 7.0
Normality :
% Solids : 100
TLV Sniffer : <20
Flash Point : >140
Heating Value BTU/LB :
Heating Value BTU/GAL :
Hexavalent Chromium Cr :
Water Soluble :
Sulfides :
Organic Chlorides : NEG
TOX : NEG
TOC :
Cyanides as CN Total mg/l :
Cyanides as CN Free mg/l :
PCBs :
TOX Leachate :
Free Liquids : NEG

PROCESS PRODUCING WASTE : PLATING SHOPS

APPROVAL C Rosendale DATE 9-17-87 DENIAL _____ DATE _____
APPROVAL _____ DATE _____ DENIAL _____ DATE _____

U.S. POLLUTION CONTROL, INC.

HAZARDOUS WASTE PROFILE SHEET

6246

EXHIBIT A TO _____ Contract Dated _____

As prescribed by the Resource Conservation and Recovery Act (Public Law 98-580 Sec. 3004), a detailed chemical and physical analysis must be submitted before we can handle your waste stream. This information is necessary to help us evaluate whether we can safely and economically transport and dispose of your controlled industrial wastes in an environmentally sound manner. Be as complete as possible. If an area is not applicable, mark as such. Should a laboratory analysis be available, please attach it to this form. We can arrange analytical laboratory services, if needed, for an appropriate fee. All information we receive will be held in strictest confidence to protect your interests. SAMPLE WILL NOT BE PROCESSED UNLESS ALL AREAS OF THIS SHEET ARE PROPERLY FILLED IN. A fee of _____ will be charged for processing this sample.

GM87-2254

Sales Representative Dick Haun

I. Generator Information

( ) Check if small quantity Generator per CFR-40

Name of Company BAY AREA ENVIRONMENTAL

US EPA ID CAT080014079

Facility Address 1125 Hensley St. Richmond CA 94804

Mailing Address SAME

Technical Contact J. Wells

Title Project Mgr Phone (408 435-8580

General Contact _____

Title _____ Phone ( ) _____

II. Waste Stream General Information

ANTICIPATED VOLUME 5000 gal per year X

Waste Name WASTE ACIDS

per month _____ per week _____ one time only _____

Process Producing Waste PLATING SHOP

Color GREEN Odor ACRID

III. Waste Properties

Physical State @ 25°C

(X) Liquid ( ) Powder

( ) Solid ( ) Sludge

Layers

(X) Single Phase

( ) Bi-layered

( ) Multi-layered

Free Liquids

(X) Yes

( ) No

pH 0 → 2.0 Normality 2.0

Type Acid _____ Type _____

Density 10 Caustic _____

( ) Organic

(X) Inorganic

Flash Point

_____ °F

Chemical Composition (X)% ( ) PPM

(List all known)

	Range Lower	Upper
Hydrochloric	(0)	(6)
Sulfuric	(0)	(10)
Nitric	(20)	(38)
_____	( )	( )
_____	( )	( )
_____	( )	( )
_____	( )	( )

Metals-EP Tox Test — Mg/l or PPM

Arsenic (As)	(N/A)	Lead (Pb)	(N/A)	Nickel (Ni)	(4000)
Barium (Ba)	(N/A)	Vanadium (V)	(N/A)	Zinc (Zn)	(N/A)
Cadmium (Cd)	(N/A)	Selinium (Se)	(N/A)	Thallium (Ti)	(N/A)
Chromium (Cr)	(1000)	Silver (Ag)	(N/A)	Cobalt (Co)	(N/A)
Mercury (Hg)	(N/A)	Cooper (Cu)	(N/A)		

Possible Component (include unit of measure)

Cyanides N/A 2, 4, D N/A Dioxin N/A

Sulfides N/A Phenolics N/A Organic Chlorides N/A

IV. PCB Oil: Type N/A Concentration _____ % ppm _____ PCB Equip: Type _____ Concentration _____ % ppm _____

PCB Solids: Type _____ Concentration _____ % ppm _____ Has equipment been drained and flushed according to 40 CFR Part 761? ___

Attach information for dimensions, weight and nameplate capacity for all equipment.

V. Hazardous Characteristics (From CFR-40)

U.S. EPA Hazardous Code(s) D002

Is the waste ( ) Pyrophoric ( ) Infectious ( ) Water reactive ( ) Radioactive ( ) Pathogenic

( ) Explosive ( ) Pesticides/Herbicides ( ) Biological ( ) Shock sensitive ( ) Etological

VI. Shipping Information (From CFR-40)

Proper DOT Shipping Name WASTE CORROSIVE LIQUID, N.O.S.

DOT Hazard Class Corrosive Material UN/NA Number UN 1760 Reportable Quantity 1000 lbs

Method of Shipment ( ) Bulk Liquids ( ) Bulk Solids

(X) Drums ( ) Other

Special Handling and Safety Instructions USE ACID GEAR WHEN HANDLING,

9/23

U.S. POLLUTION CONTROL, INC.

GRASSY MOUNTAIN FACILITY
WASTE ANALYSIS
SAMPLE SHEET

ANALYST Glenn Sorensen

GM8 7-2254 WASTE PROFILE SHEET # 6246 BROKER # _____

DATE RECEIVED 08/26/87 GENERATOR Bay Area Environmental

DATE OF ANALYSIS 08/26/87 WASTE NAME Waste acids

Mild ODOR	_____ HEATING VALUE BTU/lb
Clear COLOR	_____ HEATING VALUE BTU/gal
PHYSICAL STATE: LIQUID (X) SOLID ( ) SLUDGE ( )	_____ HEX CHROMIUM mg/l
Poor. FREE LIQUIDS	_____ WATER SOLUBLE
N/A FLYASH FACTOR	_____ SULFIDES
1.18 SPEC. GRAVITY	NEG TOX
0.4 PH	_____ TOX LEACHATE
4.5 NORMALITY	_____ TOC
1.0 % SOLIDS	_____ CYANIDES as CN FREE mg/l
<20 TLV SNIFFER	_____ CYANIDES as CN TOTAL mg/l
>140 FLASH POINT	_____ PCB's ppm
_____ ASH CONTENT ON IGNITION	

LES REP: Mich Haun TYPE OF CONTAINER: DM

MMENTS: _____

LLING:
STANDARD ( ) RUSH ( ) ON ARRIVAL/EMERGENCY (X)
SM QTY GEN ( ) LAB PACK ( ) NONE ( )

TSIDE LAB ANALYSIS:

EATMENT:
NEURTALIZATION (X) SOLIDIFICATION (X) CHROMATE REDUCTION ( )
ENCAPSULATION ( ) SOLVENT RECOVERY ( ) BOILER FUELS ( )
OTHER:

_____ 9/23/87

U.S.
POLLUTION
CONTROL, INC.

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CUSTOMER SAMPLE REFERENCE NUMBER : GM87-2254

GENERATOR

BAY AREA ENVIRONMENTAL
1125 HENSLAY
RICHMOND CA 94801
ATTENTION : DAVID BURTON
PLEASE FORWARD TO ENVIRONMENTAL DEPT.!

BROKER

NO BROKER FOR THIS SAMPLE

ANALYST NAME : GLENN SORENSON
SALES REP: MICK HAUN
SAMPLE ARRIVAL DATE : 08/26/87
PROFILE ARRIVAL DATE : 08/26/87
CUSTOMER SAMPLE # : GM87-2254
SAMPLE SITE : RICHMOND/CALIF
DATE COMPLETED : 08/26/87

ACCEPTANCE/DENIAL INFORMATION

ACCEPTABLE FOR DISPOSAL WITH THE FOLLOWING TREATMENT
NEUTRALIZATION & SOLIDIFICATION
COMMENTS:
TYPE OF CONTAINER : Metal drums barrels kegs

WASTE ANALYSIS INFORMATION

WASTE PROFILE SHEET # 6246
WASTE NAME : WASTE ACIDS
ODOR : N/A
COLOR : CLEAR
PHYSICAL STATE : LIQUID
Specific Gravity : 1.18
pH : 0.4
Normality : 4.5
% Solids : 1.0
TLV Sniffer : <20
Flash Point : >140
Heating Value BTU/LB :
Heating Value BTU/GAL :
Hexavalent Chromium Cr :
Water Soluble :
Sulfides : NEG
Organic Chlorides : NEG
TOX : NEG
TOC :
Cyanides as CN Total mg/l :
Cyanides as CN Free mg/l : NEG
PCBs :
TOX Leachate : N/A
Free Liquids : POS
PROCESS PRODUCING WASTE : PLATING SOLUTION

APPROVAL MLC DATE 9/26/87 DENIAL _____ DATE _____
APPROVAL _____ DATE _____ DENIAL _____ DATE _____

U60 9/71

U.S. POLLUTION CONTROL, INC.

GRASSY MOUNTAIN FACILITY
WASTE ANALYSIS
SAMPLE SHEET

ANALYST JC

JM8 7-2506 WASTE PROFILE SHEET # 6247 BROKER #

DATE RECEIVED 9/19/87 GENERATOR Bay Area Env.

DATE OF ANALYSIS 9/17/87 WASTE NAME Cyanide Sol

****

None	ODOR		HEATING VALUE BTU/lb
Orange	COLOR		HEATING VALUE BTU/gal
PHYSICAL STATE: LIQUID (X) SOLID ( ) SLUDGE ( )			HEX CHROMIUM mg/l
pos.	FREE LIQUIDS		WATER SOLUBLE
1.18	FLYASH FACTOR	N	SULFIDES
1.17	SPEC. GRAVITY	N	TOX
12.0	PH		TOX LEACHATE
.60	NORMALITY		TOC
1	% SOLIDS	pos	CYANIDES as CN FREE mg/l
L20	TLV SNIFFER		CYANIDES as CN TOTAL mg/l
>140	FLASH POINT		PCB's ppm
	ASH CONTENT ON IGNITION		

****

SALES REP: Mick Hearn TYPE OF CONTAINER: Dm

COMMENTS:

BILLING:
STANDARD ( ) RUSH ( ) ON ARRIVAL/EMERGENCY (X)
SM QTY GEN ( ) LAB PACK ( ) NONE ( )

OUTSIDE LAB ANALYSIS:

TREATMENT:
NEURTALIZATION ( ) SOLIDIFICATION (✓) CHROMATE REDUCTION ( )
ENCAPSULATION (✓) SOLVENT RECOVERY ( ) BOILER FUELS ( )
OTHER:

LAB ACCEPTANCE MS DATE 9/19/87 LAB DENIAL DATE

U.S. POLLUTION CONTROL, INC.

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CUSTOMER SAMPLE REFERENCE NUMBER : GM87-2506

GENERATOR

BAY AREA ENVIRONMENTAL
1125 HENSLAY
RICHMOND CA 94801
ATTENTION : DAVID BURTON
PLEASE FORWARD TO ENVIRONMENTAL DEPT.!

BROKER

NO BROKER FOR THIS SAMPLE

ANALYST NAME : GLENN SORENSON
SALES REP: MICK HAUN
SAMPLE ARRIVAL DATE : 09/09/87
PROFILE ARRIVAL DATE : 09/09/87

CUSTOMER SAMPLE # : GM87-2506
SAMPLE SITE : RICHMOND/CALIF
DATE COMPLETED : 09/17/87

ACCEPTANCE/DENIAL INFORMATION

ACCEPTABLE FOR DISPOSAL WITH THE FOLLOWING TREATMENT
SOLIDIFICATION
COMMENTS: ENCAPSULATION
TYPE OF CONTAINER : Metal drums barrels kegs

WASTE ANALYSIS INFORMATION

WASTE PROFILE SHEET # 6247
WASTE NAME : CYANIDE SOLUTION
ODOR : NONE
COLOR : ORANGE
PHYSICAL STATE : LIQUID

Specific Gravity : 1.17
pH : 12.0
Normality : .60
% Solids : 1
TLV Sniffer : <20
Flash Point : >140
Heating Value BTU/LB :
Heating Value BTU/GAL :
Hexavalent Chromium Cr :
Water Soluble :
Sulfides : NEG
Organic Chlorides : NEG
TOX : NEG
TOC :
Cyanides as CN Total mg/l :
Cyanides as CN Free mg/l : POS
PCBs :
TOX Leachate : N/A
Free Liquids : POS

PROCESS PRODUCING WASTE : PLATING TANKS

APPROVAL _____ DATE 9-21-87 DENIAL _____ DATE _____
APPROVAL _____ DATE _____ DENIAL _____ DATE _____

U.S. POLLUTION CONTROL, INC.

HAZARDOUS WASTE PROFILE SHEET

6247

EXHIBIT A TO _____ Contract Dated _____

As prescribed by the Resource Conservation and Recovery Act (Public Law 98-580 Sec. 3004), a detailed chemical and physical analysis must be submitted before we can handle your waste stream. This information is necessary to help us evaluate whether we can safely and economically transport and dispose of your controlled industrial wastes in an environmentally sound manner. Be as complete as possible. If an area is not applicable, mark as such. Should a laboratory analysis be available, please attach it to this form. We can arrange analytical laboratory services, if neded, for an appropriate fee. All information we receive will be held in strictest confidence to protect your interests. **SAMPLE WILL NOT BE PROCESSED UNLESS ALL AREAS OF THIS SHEET ARE PROPERLY FILLED IN.** A fee of _____ will be charged for processing this sample.

GM87-2501 Sales Representative Dick Haun

I. Generator Information

( ) Check if small quantity Generator per CFR-40

Name of Company BAY AREA ENVIRONMENTAL US EPA ID CAT080014079

Facility Address 1125 HENSLEY ST. Mailing Address SAME

Richmond CA 94801

Technical Contact J. Wells Title Project mgr. Phone (408) 435-8580

General Contact J. Wells Title " Phone ( ) "

II. Waste Stream General Information

Waste Name Waste Cyanide soln ANTICIPATED VOLUME 5000 gal per year X

Process Producing Waste plating tanks per month _____ per week _____ one time only _____

Color _____ Odor _____

III. Waste Properties

Physical State @ 25°C: (X) Liquid ( ) Powder ( ) Solid ( ) Sludge

Layers: (X) Single Phase ( ) Bi-layered ( ) Multi-layered

Free Liquids: (X) Yes ( ) No

pH 6-9 Normality 1.0 Type Acid — Type — Density — Caustic —

(X) Organic ( ) Inorganic

Flash Point ND °F

Chemical Composition ( )% ( ) PPM

(List all known)	Range Lower	Upper
silver cyanide	(0)	(10)
	( )	( )
copper cyanide	(0)	(10)
	( )	( )
	( )	( )
	( )	( )
	( )	( )

Metals-EP Tox Test — Mg/l or PPM

Arsenic (As)	(—)	Lead (Pb)	(—)	Nickel (Ni)	(—)
Barium (Ba)	(—)	Vanadium (V)	(—)	Zinc (Zn)	(—)
Cadmium (Cd)	(—)	Selinium (Se)	(—)	Thallium (Ti)	(—)
Chromium (Cr)	(—)	Silver (Ag)	(1000)	Cobalt (Co)	(—)
Mercury (Hg)	(—)	Cooper (Cu)	(1600)		

Possible Component (include unit of measure)

Cyanides Ag/Cu 1000 PPM 2, 4, D — Dioxin —

Sulfides — Phenolics — Organic Chlorides —

IV. PCB Oil: Type N/A Concentration ____ % ppm ____ PCB Equip: Type _____ Concentration ____ % ppm ____

PCB Solids: Type _____ Concentration ____ % ppm ____ Has equipment been drained and flushed according to 40 CFR Part 761? ____

Attach information for dimensions, weight and nameplate capacity for all equipment.

V. Hazardous Characteristics (From CFR-40)

U.S. EPA Hazardous Code(s) ~~D000~~ D003 Per Mark Parquette 9/9/87 LO

Is the waste ( ) Pyrophoric ( ) Infectious ( ) Water reactive ( ) Radioactive ( ) Pathogenic

( ) Explosive ( ) Pesticides/Herbicides ( ) Biological ( ) Shock sensitive ( ) Etological

VI. Shipping Information (From CFR-40)

Proper DOT Shipping Name Waste Poison B, liquid, N.O.S.

DOT Hazard Class Poison B UN/NA Number UN2810 Reportable Quantity N/A

Method of Shipment ( ) Bulk Liquids ( ) Bulk Solids

(X) Drums ( ) Other

Special Handling and Safety Instructions Caution: Avoid inhalation, ingestion, or skin absorption, keep away from acid/basic solns.

The samples have been collected using the appropriate EPA sampling guidelines

I certify and warrant that the above information, the information attached, and the waste stream as described is true and correct to the best of my knowledge and ability and not willful or deliberate omissions exist and that all known and/or suspected hazards have been disclosed, and a sample representative of the waste stream has been or is being sent to the proper facility.

J. Wells Project Mgr. 8-3-87

U60 9/71

U.S. POLLUTION CONTROL, INC.

GRASSY MOUNTAIN FACILITY
WASTE ANALYSIS
SAMPLE SHEET

ANALYST ZC

GMS Z-2506 WASTE PROFILE SHEET # 6247 BROKER #

DATE RECEIVED 9/9/87 GENERATOR Bay Area Env.

DATE OF ANALYSIS 9/17/87 WASTE NAME Cyanide Sol

None	ODOR		HEATING VALUE BTU/lb
Orange	COLOR		HEATING VALUE BTU/gal
PHYSICAL STATE: LIQUID (X) SOLID ( ) SLUDGE ( )			HEX CHROMIUM mg/l
POS.	FREE LIQUIDS		WATER SOLUBLE
1.8	FLYASH FACTOR	N	SULFIDES
1.17	SPEC. GRAVITY	N	TOX
12.0	PH		TOX LEACHATE
.60	NORMALITY		TOC
1	% SOLIDS	POS	CYANIDES as CN FREE mg/l
420	TLV SNIFFER		CYANIDES as CN TOTAL mg/l
>140	FLASH POINT		PCB's ppm
	ASH CONTENT ON IGNITION		

SALES REP: Mick Hearn TYPE OF CONTAINER: Drm

COMMENTS:

BILLING:
STANDARD ( ) RUSH ( ) ON ARRIVAL/EMERGENCY (X)
SM QTY GEN ( ) LAB PACK ( ) NONE ( )

OUTSIDE LAB ANALYSIS:

TREATMENT:
NEURTALIZATION ( ) SOLIDIFICATION (✓) CHROMATE REDUCTION ( )
ENCAPSULATION (✓) SOLVENT RECOVERY ( ) BOILER FUELS ( )
OTHER:

LAB ACCEPTANCE MK DATE 9/19/87 LAB DENIAL DATE

U.S. POLLUTION CONTROL, INC.

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CUSTOMER SAMPLE REFERENCE NUMBER : GM87-2506

GENERATOR

BAY AREA ENVIRONMENTAL
1125 HENSLAY
RICHMOND CA 94801
ATTENTION : DAVID BURTON
PLEASE FORWARD TO ENVIRONMENTAL DEPT.!

BROKER

NO BROKER FOR THIS SAMPLE

ANALYST NAME : GLENN SORENSON
SALES REP: MICK HAUN
SAMPLE ARRIVAL DATE : 09/09/87
PROFILE ARRIVAL DATE : 09/09/87

CUSTOMER SAMPLE # : GM87-2506
SAMPLE SITE : RICHMOND/CALIF
DATE COMPLETED : 09/17/87

ACCEPTANCE/DENIAL INFORMATION

ACCEPTABLE FOR DISPOSAL WITH THE FOLLOWING TREATMENT
SOLIDIFICATION
COMMENTS: ENCAPSULATION
TYPE OF CONTAINER : Metal drums barrels kegs

WASTE ANALYSIS INFORMATION

WASTE PROFILE SHEET # 6247
WASTE NAME : CYANIDE SOLUTION
ODOR : NONE
COLOR : ORANGE
PHYSICAL STATE : LIQUID
Specific Gravity : 1.17
pH : 12.0
Normality : .60
% Solids : 1
TLV Sniffer : <20
Flash Point : >140
Heating Value BTU/LB :
Heating Value BTU/GAL :
Hexavalent Chromium Cr :
Water Soluble :
Sulfides : NEG
Organic Chlorides : NEG
TOX : NEG
TOC :
Cyanides as CN Total mg/l :
Cyanides as CN Free mg/l : POS
PCBs :
TOX Leachate : N/A
Free Liquids : POS
PROCESS PRODUCING WASTE : PLATING TANKS

APPROVAL _____ DATE 9-21-87 DENIAL _____ DATE _____
APPROVAL _____ DATE _____ DENIAL _____ DATE _____

U.S. POLLUTION CONTROL, INC.

HAZARDOUS WASTE PROFILE SHEET

6247

EXHIBIT A TO _____ Contract Dated _____

As prescribed by the Resource Conservation and Recovery Act (Public Law 98-580 Sec. 3004), a detailed chemical and physical analysis must be submitted before we can handle your waste stream. This information is necessary to help us evaluate whether we can safely and economically transport and dispose of your controlled industrial wastes in an environmentally sound manner. Be as complete as possible. If an area is not applicable, mark as such. Should a laboratory analysis be available, please attach it to this form. We can arrange analytical laboratory services, if neded, for an appropriate fee. All information we receive will be held in strictest confidence to protect your interests. **SAMPLE WILL NOT BE PROCESSED UNLESS ALL AREAS OF THIS SHEET ARE PROPERLY FILLED IN.** A fee of _____ will be charged for processing this sample.

GM87-2501 Sales Representative Dick Haun

I. Generator Information

( ) Check if small quantity Generator per CFR-40

Name of Company Bay Area Environmental

US EPA ID CAT080014079

Facility Address 1125 Hensley St. Richmond CA 94801

Mailing Address Same

Technical Contact J. Wells Title Project mgr. Phone (408) 435-8580

General Contact J. Wells Title " Phone ( ) "

II. Waste Stream General Information

Waste Name Waste Cyanide soln

ANTICIPATED VOLUME 5000 gal per year X

per month _____ per week _____ one time only _____

Process Producing Waste plating tanks

Color _____ Odor _____

III. Waste Properties

Physical State @ 25°C: (X) Liquid ( ) Powder ( ) Solid ( ) Sludge

Layers: (X) Single Phase ( ) Bi-layered ( ) Multi-layered

Free Liquids: (X) Yes ( ) No

pH 6-9 Normality 1.0

Type Acid — Type —

Density — Caustic —

(X) Organic ( ) Inorganic

Flash Point >0 °F

Chemical Composition ( )% ( ) PPM (List all known)

	Range Lower	Upper
silver cyanide	(0)	(10)
	( )	( )
copper cyanide	(0)	(10)
	( )	( )
	( )	( )
	( )	( )
	( )	( )

Metals-EP Tox Test — Mg/l or PPM

Arsenic (As)	(<)	Lead (Pb)	(<)	Nickel (Ni)	(<)
Barium (Ba)	(<)	Vanadium (V)	(<)	Zinc (Zn)	(<)
Cadmium (Cd)	(<)	Selinium (Se)	(<)	Thallium (Ti)	(<)
Chromium (Cr)	(<)	Silver (Ag)	(1000)	Cobalt (Co)	(<)
Mercury (Hg)	(<)	Cooper (Cu)	(1600)		

Possible Component (include unit of measure)

Cyanides Ag/Cu 1000 ppm 2, 4, D — Dioxin —

Sulfides — Phenolics — Organic Chlorides —

IV. PCB Oil: Type N/A Concentration ____ % ppm ____ PCB Equip: Type ____ Concentration ____ % ppm ____

PCB Solids: Type ____ Concentration ____ % ppm ____ Has equipment been drained and flushed according to 40 CFR Part 761? ____

Attach information for dimensions, weight and nameplate capacity for all equipment.

V. Hazardous Characteristics (From CFR-40)

U.S. EPA Hazardous Code(s) ~~P030~~ D003 Per Mark Parquette 9/9/87 LO

Is the waste ( ) Pyrophoric ( ) Infectious ( ) Water reactive ( ) Radioactive ( ) Pathogenic ( ) Explosive ( ) Pesticides/Herbicides ( ) Biological ( ) Shock sensitive ( ) Etological

VI. Shipping Information (From CFR-40)

Proper DOT Shipping Name Waste Poison B, liquid, N.O.S.

DOT Hazard Class Poison B UN/NA Number UN2810 Reportable Quantity N/A

Method of Shipment ( ) Bulk Liquids ( ) Bulk Solids (X) Drums ( ) Other

Special Handling and Safety Instructions Caution: Avoid inhalation, ingestion, or skin absorption, keep away from acid/basic solns.

The samples have been collected using the appropriate EPA sampling guidelines

I certify and warrant that the above information, the information attached, and the waste stream as described is true and correct to the best of my knowledge and ability and not willful or deliberate omissions exist and that all known and/or suspected hazards have been disclosed, and a sample representative of the waste stream has been or is being sent to the proper facility.

****

RECORD NUMBER 9950 LOGGED BY DM LOAD LOG DATE: 08/27/87

GENERATOR BAY AREA ENVIRONMENTAL
ADDRESS 1125 MENGLAY ACCEPTANCE CODE
CITY ST RICHMOND, CA
ZIP 94801
TELEPHONE 415/233-8001

SAMPLE#	LOAD TICKET#	LOAD#	MANIFEST#	EPA ID#	EPA WC1	EPA WC2	EPA WC3	HAULER	QUANTITY	TOTAL POUNDS
4049	10588	4049	00001	CAT080014079	D002	NONE	NONE	CAT080013469	56 D	20200

% SOLID	S.G.	PH	NORM	SNIFF	FLASH	TOX	TOC	FREE LIQUIDS	HAND/CODES	PHYSICAL APPEARANCE	LBS--THIS AREA
0											0

DISP/AREA	DISP/DATE	SECTION	LAYER	ROW	DRUM THRU DRUM	ROW TO ROW	ROW TO ROW	ROW TO ROW	TRUCK TYPE
									V

DESCRIPTION---MIXED DRUMS PROCESS---

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****

RECORD NUMBER 10553 LOGGED BY DM LOAD LOG DATE: 08/27/87

B8-7-11-1-15

GENERATOR BAY AREA ENVIRONMENTAL

ADDRESS 1125 HENSLAY ACCEPTANCE CODE GN87-2253

CITY ST RICHMOND, CA

ZIP 94001

TELEPHONE 415/233-8001

SAMPLE#	LOAD TICKET#	LOAD#	MANIFEST#	EPA ID#	EPA WC1	EPA WC2	EPA WC3	HAULER	QUANTITY	TOTAL POUNDS
1613A	10598	4649	00001	CAT0B0014079	D003	NONE	NONE	CAT0B0013169	31 D	28200

% SOLID	S.G.	PH	NORM	SNIFF	FLASH	TOX	TOC	FREE LIQUIDS	HAND/CODES	PHYSICAL APPEARANCE	LBS THIS AREA
100	.5	7.0		<20	>140	NEG		NEG	D80/	MULTI SOLID	12887

DISP/AREA	DISP/DATE	SECTION	LAYER	ROW	DRUM THRU DRUM	ROW TO ROW	ROW TO ROW	ROW TO ROW	TRUCK TYPE
C2	08/28	D8	7	12	1 16				V

DESCRIPTION WASTE BLEACH PROCESS

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RECORD NUMBER 10554 LOGGED BY DM LOAD LOG DATE: 08/27/87
3RD HC T31
GENERATOR DAY AREA ENVIRONMENTAL
ADDRESS 1125 HENSLAY ACCEPTANCE CODE GM87-2254
CITY ST RICHMOND, CA
ZIP 94801
TELEPHONE 415/233-8001

SAMPLE#	LOAD TICKET#	LOAD#	MANIFEST#	EPA ID#	EPA WC1	EPA WC2	EPA WC3	HAULER	QUANTITY	TOTAL POUNDS
4649A	10508	4649	00001	CAT080011079	D002	NONE	NONE	CAT000013469	16 D	22280

% SOLID	S.G.	PH	NORM	SNIFF	FLASH	TOX	TOC	FREE LIQUIDS	HAND/CODES	PHYSICAL APPEARANCE	LBS THIS AREA
1	1.18	1	4.5	420	>140	NEG		FOR/T47/NEG	T47/D00	CLEAR LIQUID	6651

DISP/AREA	DISP/DATE	SECTION	LAYER	ROW	DRUM THRU DRUM	ROW TO ROW	ROW TO ROW	ROW TO ROW	TRUCK TYPE
C2	08/28	F4							V

DESCRIPTION---WASTE ACIDS PROCESS---

****

RECORD NUMBER 10555 LOGGED BY DM LOAD LOG DATE: 08/27/87

3RD HC T31

GENERATOR BAY AREA ENVIRONMENTAL

ADDRESS 1125 NEWLAY ACCEPTANCE CODE GM87-2252

CITY ST RICHMOND, CA

ZIP 94801

TELEPHONE 415/233-8001

SAMPLE#	LOAD TICKET#	LOAD#	MANIFEST#	EPA ID#	EPA WC1	EPA WC2	EPA WC3	HAULER	QUANTITY	TOTAL POUNDS
4649A	10588	4649	00001	CAT080014070	D002	NONE	NONE	CAT080013469	3 D	23280

% SOLID	S.G.	PH	NORM	SNIFF	FLASH	TOX	TOC	FREE LIQUIDS	HAND/CODES	PHYSICAL APPEARANCE	LBS THIS AREA
1	1.11	0.1	9.1	420	>140	NEG		PCB/T47/NEG	T47,D30	RED LIQUID	3742

DISP/AREA	DISP/DATE	SECTION	LAYER	ROW	DRUM THRU DRUM	ROW TO ROW	ROW TO ROW	ROW TO ROW	TRUCK TYPE
C2	08/28	F1							

DESCRIPTION--WASTE BATTERY ACID PROCESS---

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****

RECORD NUMBER 10657 LOGGED BY DM LOAD LOG DATE: 09/09/87

GENERATOR BAY AREA ENVIRONMENTAL
ADDRESS 1125 HENSLAY ACCEPTANCE CODE
CITY ST RICHMOND, CA
ZIP 94801
TELEPHONE 415/233 8001

SAMPLE#	LOAD TICKET#	LOAD#	MANIFEST#	EPA ID#	EPA WC1	EPA WC2	EPA WC3	HAULER	QUANTITY	TOTAL POUNDS
4811	10755	4811	00001	CAT000014079	D002	NONE	NONE	CAD000547036	19 D	8690

% SOLID	S.G.	PH	NORM	SNIFF	FLASH	TOX	TOC	FREE LIQUIDS	HAND/CODES	PHYSICAL APPEARANCE	LBS THIS AREA
0											0

DISP/AREA	DISP/DATE	SECTION	LAYER	ROW	DRUM THRU DRUM	ROW TO ROW	ROW TO ROW	ROW TO ROW	TRUCK TYPE
									FB

DESCRIPTION MIXED DRUMS PROCESS

****

RECORD NUMBER 11680 LOGGED BY DM LOAD LOG DATE: 09/09/87

ENCAP. #87-40 3RD HC T47

GENERATOR BAY AREA ENVIRONMENTAL

ADDRESS 1125 HENSLEY ACCEPTANCE CODE GM87-2506

CITY ST RICHMOND, CA

ZIP 94801

TELEPHONE 415/233-8001

SAMPLE#	LOAD TICKET#	LOAD#	MANIFEST#	EPA ID#	EPA WC1	EPA WC2	EPA WC3	HAULER	QUANTITY	TOTAL POUNDS
4811A	10755	4811	00001	CAT080014079	D003	NONE	NONE	CAD063547996	19 D	8690

% SOLID	S.G.	PH	NORM	SNIFF	FLASH	TOX	TOC	FREE LIQUIDS	HAND/CODES	PHYSICAL APPEARANCE	LBS. THIS AREA
1	1.17	12	.6	420	>140	NEG		POS/T47/NEG	T39/D80	ORANGE LIQUID	8690

DISP/AREA	DISP/DATE	SECTION	LAYER	ROW	DRUM THRU DRUM	ROW TO ROW	ROW TO ROW	ROW TO ROW	TRUCK TYPE
C3	09/30	A5	2						FB

DESCRIPTION---WASTE CYANIDE SOLUTION PROCESS---

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#5

09/01 - 09/30
CAT080014079

GENERATOR LOG 1987 02-02-1988
FOR PERIOD BEGINNING 09/01--ENDING 09/30

BAY AREA ENVIRONMENTAL
1125 HENSLAY
RICHMOND,CA 94801

LOAD#	MAN #	RECORD#	DATE	DISP.AREA	EPA WC	POUNDS	DISPOSAL DATE	QUANTITY
4811	00001	11680	09/09/87	C3	D003-NONE-NONE	8690	09/30	19 D

TOTAL QUANTITY 8690 YARDS 0
TOTAL NUMBER OF LOADS 1

#6

CAT080014079

GENERATOR LOG 1987 02-02-1988
FOR PERIOD BEGINNING 08/03--ENDING 08/31

BAY AREA ENVIRONMENTAL
1125 HENSLAY
RICHMOND,CA 94801

LOAD#	MAN #	RECORD#	DATE	DISP.AREA	EPA WC	POUNDS	DISPOSAL DATE	QUANTITY
4649	00001	10553	08/27/87	C2	NONE-NONE-NONE	12887	08/28	31 D

TOTAL QUANTITY 12887 YARDS 0
TOTAL NUMBER OF LOADS 20?

RECORD NUMBER 3667 **LOGGED BY DM** **LOAD LOG** **DATE: 03/16/87**

GENERATOR LAWRENCE LIVERMORE NATIONAL LABORATORY
ADDRESS 7000 EAST AVE/P.O. BOX 5505 ACCEPTANCE CODE GM86-1769
CITY ST LIVERMORE, CA
ZIP 94550
TELEPHONE 415/423-0398

SAMPLE#	LOAD TICKET#	LOAD#	MANIFEST#	EPA ID#	EPA WC1	EPA WC2	EPA WC3	HAULER	QUANTITY	TOTAL POUNDS
19736	08751	1973	70055	CA2890012584	NONE	NONE	NONE	CAT000624247	6 D	28400

% SOLID	S.G.	PH	NORM	SNIFF	FLASH	TOX	TOC	FREE LIQUIDS	HAND/CODES	PHYSICAL APPEARANCE	LBS. THIS AREA
4.7	1.07	5.5		1500	>140	NEG		POS/T477/NEG	T477D80	BROWN LIQUID	5042

DISP/AREA	DISP/DATE	SECTION	LAYER	ROW	DRUM THRU DRUM	ROW TO ROW	ROW TO ROW	ROW TO ROW	TRUCK TYPE
C2	03/19	64							TD

DESCRIPTION WASTE OIL DEBRIS PROCESS

RECORD NUMBER 3666 LOGGED BY DM LOAD LOG DATE: 03/16/87

GENERATOR LAWRENCE LIVERMORE NATIONAL LABORATORY
ADDRESS 7000 EAST AVE/P.O. BOX 5505 ACCEPTANCE CODE GM87-0604
CITY ST LIVERMORE, CA
ZIP 94550
TELEPHONE 415/423-0398

SAMPLE#	LOAD TICKET#	LOAD#	MANIFEST#	EPA ID#	EPA WC1	EPA WC2	EPA WC3	HAULER	QUANTITY	TOTAL POUNDS
1973F	08751	1973	70055	CA2890012584	D007	NONE	NONE	CAT000624247	4 D	28400

% SOLID	S.G.	PH	NORM	SNIFF	FLASH	TOX	TOC	FREE LIQUIDS	HAND/CODES	PHYSICAL APPEARANCE	LBS. THIS AREA
1	1.01	6.5		<20	>140	NEG		POS/T47/NEG	T47/D80	CLEAR LIQUID	2556

DISP/AREA	DISP/DATE	SECTION	LAYER	ROW	DRUM THRU DRUM	ROW TO ROW	ROW TO ROW	ROW TO ROW	TRUCK TYPE
C2	03/19	84							FB

DESCRIPTION---WASTE ORGANIC LIQUIDS PROCESS---

****

RECORD NUMBER 3665 LOGGED BY DM LOAD LOG DATE: 03/16/87

F5-6-7-1-12

GENERATOR LAWRENCE LIVERMORE NATIONAL LABORATORY

ADDRESS 7000 EAST AVE/P.O. BOX 5505 ACCEPTANCE CODE GM87 0603

CITY ST LIVERMORE, CA

ZIP 94550

TELEPHONE 415/423-0398

SAMPLE#	LOAD TICKET#	LOAD#	MANIFEST#	EPA ID#	EPA WC1	EPA WC2	EPA WC3	HAULER	QUANTITY	TOTAL POUNDS
1973E	08751	1973	70055	CA2890012584	D004	D007	D008	CAT000624247	24 D	28400

% SOLID	S.G.	PH	NORM	SNIFF	FLASH	TOX	TOC	FREE LIQUIDS	HAND/CODES	PHYSICAL APPEARANCE	LBS THIS AREA
61.3	.71	6.5		<20	>140	NEG		NEG	D807	MULTI SOLIDS	12173

DISP/AREA	DISP/DATE	SECTION	LAYER	ROW	DRUM THRU	DRUM	ROW TO ROW	ROW TO ROW	ROW TO ROW	TRUCK TYPE
C2	03/20	F5	6	6	1	12				FB

DESCRIPTION WASTE RESIN SLUDGE PROCESS

RECORD NUMBER 3664 LOGGED BY DM **LOAD LOG** **DATE: 03/16/87**

F5-6-5-1-10

GENERATOR LAWRENCE LIVERMORE NATIONAL LABORATORY
ADDRESS 7000 EAST AVE/P.O. BOX 5505 ACCEPTANCE CODE GM87 0602
CITY ST LIVERMORE, CA
ZIP 94550
TELEPHONE 415/423-0398

SAMPLE#	LOAD TICKET#	LOAD#	MANIFEST#	EPA ID#	EPA WC1	EPA WC2	EPA WC3	HAULER	QUANTITY	TOTAL POUNDS
1973D	08751	1973	70055	CA2890012584	D007	NONE	NONE	CAT000624247	18 D	28400

% SOLID	S.G.	PH	NORM	SNIFF	FLASH	TOX	TOC	FREE LIQUIDS	HAND/CODES	PHYSICAL APPEARANCE	LBS THIS AREA
1	1.01	8.5		<20	>140	NEG		POS/T47/NEG	T47/D80	BROWN LIQUID	8621

DISP/AREA	DISP/DATE	SECTION	LAYER	ROW	DRUM THRU	DRUM ROW TO ROW	ROW TO ROW	ROW TO ROW	TRUCK TYPE
D2	03/20	F5	B	+	3	10			FB

DESCRIPTION--WASTE AQUEOUS WASTE W/CHROME PROCESS---

****

RECORD NUMBER 3663 LOGGED BY DM LOAD LOG DATE: 03/16/87

ORGANIC CHLORIDES NOT DETECTED

GENERATOR LAWRENCE LIVERMORE NATIONAL LABORATORY

ADDRESS 7000 EAST AVE/P.O. BOX 5505 ACCEPTANCE CODE GM87-0601

CITY ST LIVERMORE, CA

ZIP 94550

TELEPHONE 415/423-0398

SAMPLE#	LOAD_TICKET#	LOAD#	MANIFEST#	EPA_ID#	EPA_WC1	EPA_WC2	EPA_WC3	HAULER	QUANTITY	TOTAL_POUNDS
1973C	08751	1973	70055	CA2890012584	F002	NONE	NONE	CAT000624247	1 D	20400

% SOLID	S.G.	PH	NORM	SNIFF	FLASH	TOX	TOC	FREE LIQUIDS	HAND/CODES	PHYSICAL APPEARANCE	LBS THIS AREA
100	1	6.5		<20	>140	NEG		NEG	D007	MULTI SOLIDS	507

DISP/AREA	DISP/DATE	SECTION	LAYER	ROW	DRUM THRU DRUM	ROW TO ROW	ROW TO ROW	ROW TO ROW	TRUCK TYPE
C2	03/20	F5	6	4	2 2				TB

DESCRIPTION---CONTAMINATED SOLIDS PROCESS----

RECORD NUMBER 3661 LOGGED BY DM LOAD LOG DATE: 03/16/87

GENERATOR LAWRENCE LIVERMORE NATIONAL LABORATORY
ADDRESS 7000 EAST AVE/P.O. BOX 5505 ACCEPTANCE CODE GM87-0598
CITY ST LIVERMORE, CA
ZIP 94550
TELEPHONE 415/423-0398

SAMPLE#	LOAD TICKET#	LOAD#	MANIFEST#	EPA ID#	EPA WC1	EPA WC2	EPA WC3	HAULER	QUANTITY	TOTAL POUNDS
1973A	08751	1973	70055	CA2890012504	D002	NONE	NONE	CAT000624247	1 D	28400

% SOLID	S.G.	PH	NORM	SNIFF	FLASH	TOX	TOC	FREE LIQUIDS	HAND/CODES	PHYSICAL APPEARANCE	LBS--THIS AREA
58.8	1.04	2.0	.12	<20	>140	NLG		NLG	D807	BROWN SOLID	507

DISP/AREA	DISP/DATE	SECTION	LAYER	ROW	DRUM THRU DRUM	ROW TO ROW	ROW TO ROW	ROW TO ROW	TRUCK TYPE
C2	03/18	F5	6	4	1 1				TB

DESCRIPTION---WASTE SOLIDS W/NITRIC ACID PROCESS---

RECORD NUMBER 3246 LOGGED BY DM LOAD LOG DATE: 03

W/C 4-6 D004 D007 D008

GENERATOR LAWRENCE LIVERMORE NATIONAL LABORATORY

ADDRESS 7000 EAST AVE/P.O. BOX 5505 ACCEPTANCE CODE

CITY ST LIVERMORE, CA

ZIP 94550

TELEPHONE 415/423-0398

SAMPLE#	LOAD	TICKET#	LOAD#	MANIFEST#	EPA ID#	EPA WC1	EPA WC2	EPA WC3	HAULER	QUANTITY	TOTAL POUNDS
1973		08751	1973	70055	CA2890012584	F002	D001	D002	CAT000624247	55 D	28400

% SOLID	S.G.	PH	NORM	SNIFF	FLASH	TOX	TOC	FREE LIQUIDS	HAND/CODES	PHYSICAL APPEARANCE	LBS THIS A
0								/			0

DISP/AREA	DISP/DATE	SECTION	LAYER	ROW	DRUM THRU DRUM	ROW TO ROW	ROW TO ROW	ROW TO ROW	TRUCK IN
									FB

DESCRIPTION MIXED DRUMS PROCESS---

14112 G.B.

RECORD NUMBER 3662 **LOGGED BY DM** **LOAD LOG** **DATE: 03/16/87**

GENERATOR LAWRENCE LIVERMORE NATIONAL LABORATORY
ADDRESS 7000 EAST AVE/P.O. BOX 5505 ACCEPTANCE CODE GM87-0600
CITY ST LIVERMORE, CA
ZIP 94550
TELEPHONE 415/423-0398

SAMPLE#	LOAD TICKET#	LOAD#	MANIFEST#	EPA ID#	EPA WC1	EPA WC2	EPA WC3	HAULER	QUANTITY	TOTAL POUNDS
1973B	08751	1973	70055	CA2890012584	NONE	NONE	NONE	CAT000624247	2 D	28400

% SOLID	S.G.	PH	NORM	SNIFF	FLASH	TOX	TOC	FREE LIQUIDS	HAND/CODES	PHYSICAL APPEARANCE	LBS THIS AREA
1	1.06	7.0		<20	>140	NEG		POS/T47/NCG	T47/D00	BROWN LIQUID	IC14

DISP/AREA	DISP/DATE	SECTION	LAYER	ROW	DRUM THRU DRUM	ROW TO ROW	ROW TO ROW	ROW TO ROW	TRUCK TYPE
C2	03/19	G4							FD

DESCRIPTION--WASTE LIQUIDS PROCESS--

14112 G.B.

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2ND DRAFT
3-31-89
FOR 9002

REPORT ON TOXIC RISK ASSESSMENT FOR LIQUID WASTE STORAGE AND TRANSFER FACILITY RICHMOND, CALIFORNIA

March, 1989

Prepared for:

Bay Area Environmental
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REPORT ON
TOXIC RISK ASSESSMENT
FOR A
LIQUID WASTE STORAGE AND TRANSFER FACILITY
RICHMOND, CALIFORNIA

1. Summary

a. Project Description

This report describes the planned expansion of a liquid waste storage and transfer facility owned by Bay Area Environmental, Inc., (BAE) in Richmond, California. It also describes the procedures and results of a risk assessment performed for the planned facility, based on the expected quantities and toxicity of the materials processed for offsite disposal.

The waste storage and transfer facility is located at 1125 Hensely Street, Richmond, California. Plate 1 shows the general location of the plant, and Plate 2 shows local topography and other details of the local area. The facility has been in operation since 1983, and has to date served as a collection and transfer operation for residential, commercial and industrial clients. The facility presently accepts liquid wastes and transships these wastes to licensed toxic waste disposal sites. Wastes are shipped for disposal in the drums and containers in which the materials are received. Some mixing, blending, or repackaging of these liquid wastes presently takes place.

Upon receipt of necessary approvals, BAE will enlarge its facility to handle up to approximately 50,000 gallons per day (15,000,000 gallons per year) of domestic commercial and industrial liquid wastes. Instead of only serving as a collection and transhipping point, as is now the case, BAE plans to install 183,200 gallons of tank capacity, into which liquid wastes of a compatible composition will be transferred, stored temporarily, treated in a variety of ways, and ultimately loaded into truck tank cars in a condensed or de-watered form for offsite disposal. Water recovered in the processing will be of a quality suitable for discharge into local sewers and for treatment at the local sewage treatment plant. Shipping of residual dewatered wastes will be by truck.

An evaluaation of the cancer risk due to potential emissions from the proposed BAE facility expansion was made. The calculated risk is 3.59×10^{-7}, well below

the threshold limit of one in a million. Thus, implementation of the proposed BAE expansion plan would not result in an excess cancer risk to the local population.

b. Description of Results

Expected emissions of toxic materials are based on the historical mix of materials received at the existing facility, plus the expected mix of materials forecasted to be received when the facility goes into expanded operation. Table 1 shows the expected quantities of liquid wastes forecast to be received, stored, processed, dewatered, and transhipped offsite.

2. Introduction

a. Project Background

BAE was founded in 1983. BAE is physically located at 1125 Hensley Street, Richmond, California (see Plate 1), and occupies approximately 0.81 acres. Up to the present time, BAE has served as a liquid waste collecting and transfer point, receiving sealed wastes in various sized containers from domestic, commercial, and industrial sources, and transshipping these wastes via truck to licensed waste disposal sites. Storage time for these wastes is minimal, depending on quantity necessary to make up a truck load.

b. Nature of Project

BAE proposes to expand its existing facility in order to handle and process up to 50,000 gallons per day (15 million gallons per year) of liquid wastes from domestic, commercial, and industrial waste generators. In general, liquid wastes will be delivered to the BAE facility from these sources in quantities ranging from pints and quarts (from household and small commercial sources) up to several thousand gallons (from major industrial sources). Incoming wastes will be characterized by generic type, and segregated into common materials (acids, bases, oils, solvents, flammables, etc.). Similar materials will be pumped from their original containers and temporarily stored in tanks. When sufficient quantities of these materials are accumulated, they will be processed by various means to separate water from the wastes. Processing will be performed by several mobile transportable treatment systems. The mobile treatment systems are physical-chemical treatment configurations designed to remove hazardous wastes. The systems are portable and may be

installed temporarily at a site to process waste material and produce a "clean" effluent stream and a dry cake. The systems employ various physical and chemical conditioning treatment, including but not limited to, neutralization, coagulation, flocculation, precipitation, ion exchange, and carbon adsorption. The conditioning treatment sequence is generally followed by a solid-liquid separation performed by standard commercial rotary drum vacuum filter, filter press, centrifuge, horizontal belt filters, or other commercial separation systems. The process capacity for each system will range from 10,000 to 50,000 gallons per day and depend on the filtration characteristics of the waste stream and system configuration. The total hazardous and toxic waste stream volume can be reduced by as much as 95%. The liquid effluent will meet federal, state, and local discharge standards.

c. Description of the Facility

The BAE site in Richmond, California is located on approximately 0.81 acres (35,000 square feet) of land at 1125 Hensley Street. A site layout showing existing facilities and the proposed additions is shown in Plate 3. The proposed additions primarily consist of the addition of twenty-seven tanks of 183,200 gallons capacity to store incoming and processed liquid wastes, plus space dedicated to the intermittent presence of trailer mounted mobile treatment systems. All tanks will be equipped with pumps and loading arms, with vapor recovery carbon adsorption drums servicing each. Plate 4 shows the proposed product and waste flows and the associated control equipment.

d. Projection for the Future

BAE's existing facility presently handles domestic, commercial, and industrial wastes. Wastes are received in various glass and metal containers, drums, and other sealed receptacles. After short-term storage in order to accumulate a full truck-load, the wastes are then loaded and shipped by truck to an authorized disposal site.

The proposed expansion of the BAE facilities will provide the necessary storage and equipment to handle up to 15 million gallons per year of liquid toxic wastes. Expansion plans allow for an immediate increase in storage capacity to handle up to 50,000 gallons per day. The implication associated with this expectation is that wastes will be stored for relatively longer periods of time at first, and tank-truck trips will be relatively

infrequent. As use increases over the next several years, storage time will decrease, as will the time between truck shipments, and the frequency of treatment will increase.

3. Risk Assessment Procedures

a. Hazard Assessment

1. Identification of Chemicals

Because of a number of uncertainties relating to sources of liquid wastes which will be received in the future, it is difficult to predict the actual mix of substances as the facility reaches full design capacity. However, based on historical information on materials previously received, plus forecasts of new client development and their inventories of liquid waste materials, it has been possible to develop an estimate of substances which are expected to be received and processed. Table 2 lists materials which will be acceptable from domestic, commercial, and industrial sources for storage and processing. Table 3 lists the industries and processes which are expected to be sources of liquid wastes.

2. Toxicological Considerations

At full capacity of 50,000 gallons per day, the BAE facility will be receiving liquid waste substances from a large number of domestic, commercial, and industrial sources, such as those previously described in Table 3. A substantial portion of these liquid wastes will contain a variety of toxic and carcinogenic materials. Control measures to prevent release of these substances to the environment will be implemented. These controls will be sufficient to reduce cancer risk to nearby populations to less than one chance in a million, well below all published standards of risk.

3. Identification of Carcinogens

A variety of carcinogenic substances are expected to be received and processed at the BAE facility when it reaches full operating capacity. Most of these substances will be contained as small quantities of toxic materials contained within larger quantities of non-carcinogenic materials and water. Acids and bases, primarily originating with the computer chip industry, will contain a number of heavy metals, consisting of chromium, cadmium, nickel, silver, and others. The solubility of these metals is greater in the acids than in the bases, and therefore, the acids will contain

greater quantities of these dissolved metals. The oil wastes and oil-water mixes are expected to contain only a small percentage of the lighter fraction hydrocarbons; these latter will contain some small quantities of benzene. Finally, solvents received at the facility will include a percentage of solvents which have been identified by the federal government and the State of California as being carcinogenic. Calculated quantities of these carcinogenic substances are shown in Section 3.B.1, following.

b. Exposure Assessment

1. Emission Calculations

Emission calculations shown in this section are, for convenience, carried out in scientific notation. To assist those not familiar with scientific notation, Table 4 shows the relationship of scientific notation to conventional arithmetic relationships.

The BAE facility will accept approximately 15,000,000 gallons per year of liquid wastes. These wastes will be segregated into acids, bases, solvents and oils. All of these wastes will be mixed with considerable quantities of water. In addition, a number of carcinogenic substances will be intermixed or in solution with each type of liquid waste. The following paragraphs describe the manner by which atmospheric emissions of carcinogens included in the general liquid wastes have been calculated.

The following liquid waste and water mixtures will be received and processed:

4,000,000 gals of acid-water mixture
3,000,000 gals of base-water mixture
2,000,000 gals of solvent-water mixture
6,000,000 gals of oil-water mixture

4×10^6 gals/year acid-water x (1-90% water)
$= 4 \times 10^5$ gals/year acid
3×10^6 gals/year base-water x (1-90% water)
$= 3 \times 10^5$ gals/year bases
2×10^6 gals/year solvents-water x (1-40% water)
$= 1.2 \times 10^6$ gals/year solvents
6×10^6 gals/year oil-water x (1-90% water)
$= 6 \times 10^5$ gals/year oils

Acids

The acid will contain approximately 0.1% dissolved metals, of which 1% is assumed to be hexavalent chromium. 4×10^5 gals/year x 0.01 = 400 gals/year dissolved metals 400 gals/year x 0.01 hexavalent chromium = 4 gals/year hexavalent chromium.

Bases

The bases will contain approximately 0.01% dissolved metals, of which 1% is assumed to be hexavalent chromium. 3×10^5 gals/year x 0.001 = 30 gals/year dissolved metals; 30 gals.year dissolved metals x 0.01 = 0.3 gals/year hexavalent chromium.

Solvents

Solvents contain approximately 2.0% substances which are considered carcinogenic. Assume all of these carcinogens are trichloroethane (TCA). 1.2×10^6 gals/year x 0.02 TCA = 24,000 gals/year TCA.

Oils

Oils contain approximately 10% light fraction, of which 1.8% is benzene. 6×10^5 gals/year oils x 0.10 = 6.0×10^4 gals/year light fraction; 6.0×10^4 gals/year light fraction x 0.018 benzene = 1,080 gals/year benzene.

2. Calculation of Emissions

Hexavalent Chromium (CR^{+6})

Of the 4.3 gallons of CR^{+6} dissolved in the 700,000 gallons per year of acids and bases, it is estimated that 0.1 % of the CR^{+6} becomes airborne through bubbling, handling, transfer, and other physical processes.

4.3 gals CR^{+6}/year x 0.001 = 0.0043 gals CR^{+6}/year to vapor space.

Control measures will include two carbon adsorption cartridges in series, each at 95% efficiency.

(1-0.95) x (1-0.95) = 0.0025
(1-0.0025) = 99.75% efficiency

0.0043 gals CR^{+6}/year x (1-0.9975) = 1.075×10^{-5} gals CR^{+6}/year to ambient atmosphere.

$$\frac{1.075 \times 10^{-5} \text{ gal}}{\text{year}} \times \frac{\text{year}}{8{,}760 \text{ hrs}} \times \frac{\text{hour}}{3{,}600 \text{ sec}} \times \frac{0.1337 \text{ ft}^3}{\text{gallons}} \times 7.2$$

$$(\text{density}) \times \frac{62.4 \text{ lb}}{\text{ft}^3} \times \frac{454 \text{ g}}{\text{lb}} = 9.296 \times 10^{-9} \text{ g } CR^{+6}/\text{second}$$

to ambient atmosphere.

Solvents (as TCA)

Of 2.4×10^4 gallons per year of carcinogenic solvents (as trichloroethane), assume 1% is in equilibrium in the gaseous state in the tank vapor space.

$2.4 \times 10^4 \times 0.01 = 240$ gals/year TCA in vapor space

Assuming two carbon adsorption traps at 95% efficiency each in series:

240 gals/year x 0.0025 = 0.60 gals TCA/yr to ambient air:

$$\frac{0.60 \text{ gals}}{\text{year}} \times \frac{\text{year}}{8760 \text{ hrs}} \times \frac{\text{hours}}{3600 \text{ sec}} \times \frac{0.1337 \text{ ft}^3}{\text{gal}} \times 1.34 \times$$

$$\frac{62.4 \text{ lb}}{\text{ft}^3} \times \frac{454 \text{ g}}{\text{lb}} = 9.66 \times 10^{-5} \text{ g TCA/sec emitted to}$$

atmosphere.

Oils

Of 1080 gallons of benzene per year in the waste oils, assume 10% is in the vapor form above the liquid surface in the tanks.

$$\frac{1080}{\text{year}} \times 0.10 = 108 \text{ gals/yr benzene as vapor}$$

Assume two carbon adsorption cartridges in series at 95% efficiency each.

108 gal/yr benzene x 0.0025 = 0.27 gal yr to ambient air

$$\frac{0.27 \text{ gal}}{\text{year}} \times \frac{\text{yr}}{8{,}760 \text{ hr}} \times \frac{\text{hour}}{3600 \text{ sec}} \times \frac{0.1337 \text{ ft}^3}{\text{gal}} \times 0.88 \times \frac{62.4 \text{ lb}}{\text{gal}}$$

$$\times \frac{454 \text{ g}}{\text{lb}} = 2.85 \times 10^{-5} \text{ g benzene/sec emitted to atmosphere}$$

3. Air Quality Modeling

In accordance with accepted state-of-the-art modeling practices, modeling to define ground-level concentrations for emissions from the proposed SAE facility was performed using the ISCLT model formulated by the U.S. Environmental Protection Agency. The ISCLT is a steady-state Gaussian plume model which can be used to assess pollutant concentrations from a wide variety for sources associated with industrial-type sources. The model can accommodate a large number of receptor points, and utilizes a stability wind rose (joint frequency of atmospheric stability) by wind direction, wind speed, ambient temperature, and mixing height as input parameters.

For this project, the ISCLT model was run for each source species with a grid of receptors extending 2000 meters in each direction to ensure complete local coverage. Meteorological data used as input included three years of data from the Chevron refinery in Richmond. The meteorological data were obtained from the Bay Area Air Quality Management District. These data were combined into a single composite annual summary by combining the three individual years of information (1981 through 1983) into a single "STAR" summary of stability, wind speed, and wind direction. The latter was accomplished using a computer program (Supercalc) to add the three individual years of data and divide by three to produce a composite three-year joint frequency of the meteorological data.

The results of running the ISCLT computer program using the three-year meteorological data composite and the emissions as calculated in a previous section of this report indicate that maximum concentrations of the three emitted substances are

sufficiently low that any cancer risk is well below the threshold values of "one in a million". The cumulative risk is also below the threshold for all three sources combined. The computer results are shown in Table 6.

c. Risk Characterization

In accordance with currently accepted methods of characterization cancer risk,(1) the downwind concentration is multiplied by the unit risk value (URV) of the substance emitted. The result of this calculation for each of the substances released to the air environment is then added to determine the total cancer risk for all substances. Table 7 shows the unit risk value for each of the marker substances used in this analysis. Table 8 shows the calculated cancer risk for all substances combined.

As can be seen from the results of a cancer risk assessment (Table 8), the overall cancer risk via the inhalation pathway from the proposed expansion of the BAE facility is 3.59×10^{-7}, well below the threshold of one chance in a million (1×10^{-6}).

4. Conclusion

A large variety of liquid wastes will be handled and processed as a result of the proposed expansion of the BAE facility in Richmond, California. Of the 15,000,000 gallons per year of liquid wastes handled, some 12,500,000 (83 percent) will be water, which will be removed from the wastes for discharge to the sewer system and offsite treatment at the local sewage treatment plant. The remaining 2,500,000 gallons will be a mix of acids, bases, solvents, oils and other liquid wastes. These latter substances, while not carcinogenic of themselves, will contain certain amounts of carcinogens. Because the exact constitution of these wastes is uncertain, it has been assumed that the acids and bases will contain dissolved heavy metals, represented by hexavalent chromium. The solvents will contain a number of substances which have been identified as carcinogens. These have been assumed to be represented by 1,1,2-trichloroethane. Finally, the oils will contain a certain amount of carcinogenic materials, represented in this report by benzene.

---

(1) Toxic Air Pollutant Source Assessment Manual for California Air Pollution Control District, California Air Pollution Control Officer's Association (CAPCOA), October 1, 1987.

Emissions to the ambient atmosphere are controlled by two carbon adsorption cartridges placed in series, and providing 99.75% control of the carcinogenic substances contained in the liquid wastes. Atmospheric concentrations of emissions from the BAE facility were calculated using the ISCLT model and three years of meteorological data from the Chevron Refinery in Richmond.

Unit risk values of the carcinogenic substances discussed above were used to calculate the overall cancer risk via the inhalation pathway in the vicinity of the BAE facility. This cancer risk was calculated to be 3.59×10^{-7}, well below the threshold value of one in one million. Thus, implementation of the proposed BAE expansion plan would result in an acceptable risk to the local population.

Tables

TABLE 1

Quantities of Materials Received

Acids	- 4,000,000 gallons/year (90% water)
Bases	- 3,000,000 gallons/year (90% water)
Solvents	- 2,000,000 gallons/year (40% water)
Oils	- 6,000,000 gallons/year (90% water)

Quantities of Materials Received After Dewatering

Acids	- 400,000 gallons/year
Bases	- 300,000 gallons/year
Solvents	- 1,200,000 gallons/year
Oils	- 600,000 gallons/year

Table 2

Hazardous Wastes

Hazardous wastes handled at the facility include corrosives, toxics, organics, flammables, reactives, and water reactives. These include all hazardous materials covered under 40 CFR 261.20, 261.21, 261.22, 261.23, 261.24, 261.30, 261.31, 261.32, 261.33(a) through (f), Title 40 of the Federal Register, as well as acids, toxics, oxidizers, flammables, organics, oils, reactives, water reactives, caustics, alkalies, pesticides, poisons, corrosives, ORM's, generic waste codes: D Series, F Series, K Series, U Series, P Series, E.P. Toxics and California Regulated and Restricted Waste and all wastes in CAC Title 22 and Title 26, Section 6680. Wastes amenable to treatment by Permitted TTU's and those operating under a permit by rule exemption. Such wastes currently include but are not necessarily limited to:

Ignitables

Corrosives

Reactives

Arsenic

Barium

Cadmium

Chromium

Lead

Mercury

Selenium

Silver

Endrin

Lindane

Methoxychlor

Toxaphene

2,4-D

2,4,5-TP

Table 2 (continued)

Spent Halogenated Solvents and Sludges from Their Recovery

Spent Halogenated Solvents and the Still Bottoms from Their Recovery

Spent Non-Halogenated Solvents and Sludges from Their Recovery

Spent Non-Halogenated Solvents and the Still Bottoms from Their Recovery

Electroplating Treat Sludge

Spent Bath Solution from Electroplating Operations

Sludges from Bottom of Bath from Electroplating Operations

Bottom Sediment Sludge from Wood-Treating

Still Bottoms from Production of Acetaldehyde from Ethylene

Distillation Side Cuts from the Production of Acetaldehyde from Ethylene

Bottom Stream from the Wastewater Stripper in the Production of Acrylonitrile

Bottom Stream from the Acetonitrile Column in the Production of Acrylonitrile

Bottoms from the Acetonitrile Purification Column in Acrylonitrile Production

Still Bottoms from Benzyl Chloride Distillation

Heavy Ends from the Purification Column in Epichlorohydrin Production

Heavy Ends from the Fractionation Column in Ethyl Chloride Production

Heavy Ends from Vinyl Chloride Distillation in Vinyl Chloride Production

Table 2 (continued)

Aqueous Spent Antimony Catalyst Waste in Fluoromethanes Production

Distillation Bottom Tars from the Production of Phenol/Acetone from Cumene

Distillation Light Ends from the Production of Phthalic Anhydride from Naphthalene

Distillation Bottoms from the Production of Phthalic Anhydride from Naphthalene

Distillation Light Ends from the Production of Phthalic Anhydride from Ortho-Xylene

Distillation Bottoms from the Production of Phthalic Anhydride from Ortho-Xylene

Stripping Still Tails from the Production of Methyl Ethyl Pyridines

Centrifuge and Distillation Residues from the Production of Toluene Disocyanate

Waste from the Product Steam Stripper in 1,1,1-Trichloromethane Production

Distillation Bottoms from 1,1,1-Trichloromethane Production

Heavy Ends from the Heavy Ends Column in 1,1,1-Trichloromethane Production

Column Bottoms or Heavy Ends from the Combined Production of Trichloroethylene and Perchloroethylene

Distillation Bottoms from Aniline Production

Process Residues from Aniline Extraction from the Production of Aniline

Combined Wastewater Streams Generates from Nitrobenzene/Aniline Production

Distillation or Fractionation Column Bottoms from the Production of Chlorobenzenes

Separated Aqueous Stream from the Reactor Product Washing Step in the Production of Chlorobenzenes

Table 2 (continued)

Still Bottoms from Toluene Sechamation Distillation in the Production of Disulfoton

DAF Float from Petroleum Processing

Slop Oil

API Separator Sludge

Tank Bottoms (leaded) from the Petroleum Refining Industry

Spent Pickle Liquor from Steel Finishing

Heat Exchanger Bundle Cleaning Wastes

Brine Purification Muds from Chlorine Production

Sludge from Mercury Cell Process

Leach Solution from Acid Leaching of Emission Control Dust

Solvents Washes and Sludges, Caustic Washes and Sludges, or Water Washes and Sludges from Cleaning Tubes and Equipment used in the Formulation of Ink from Segments, Driers, Soaps, and Stabilizers Containing Chromium and Lead.

Ammonia Still Lime Sludge from Coking Operations

Decanter Tank Tar Sludge from Coking Operations

Alkaline Solution (pH > 12.5 with Metals)

Alkaline Solution without Metal

Aqueous Solution (2 < pH < 12.5) containing Reactive Anions (Azide, Bromate, Chlorate, Cyanide, Fluoride, Hypochlorite, Nitrite, Perchlorate, and Sulfide Anions)

Aqueous Solution with Metals

Aqueous Solution with Total Organic Residues Less than 10 Percent and/or Volatile Organic Compounds

Other Spent Catalyst

Metal Sludge

Other Inorganic Solid Waste

Table 2 (continued)

Latex Waste

Alum and Gypsum Sludge

Lime Sludge

Phosphate Sludge

Sulfur Sludge

Paint Sludge

Photochemicals/Photoprocessing Waste

Laboratory Waste Chemicals

Gas Scrubber Waste

Liquids with Cyanides > 1000 mg/L

Liquids with Arsenic > 500 mg/L

Liquids with Cadmium > 100 mg/L

Liquids with Chromium (VI) > 500 mg/L

Liquids with Lead > 800 mg/L

Liquids with Mercury > 20 mg/L

Liquids with Nickel > 134 mg/L

Liquids with Selenium > 100 mg/L

Liquids with Thallium > 130 mg/L

Liquid Waste < pH 2 with Metals

Table 3

Industrial Waste Sources

Automotive

- Water Based Cutting Fluids with Soluble Oils
- Galvanizing Wastewaters
- Latex Paint Wastewaters
- Plating Wastes
- Spent Solvents, Oils, and Paints

Aircraft

- Plating Wastes
- Water Based Cutting Fluids
- Oily Wastewaters
- Galvanizing Wastewaters
- Spent Solvents, Oils, and Paints

Air Conditioning and Refrigeration

- Metal Finishing Wastes
- Plating Wastes
- Spent Solvents, Oils, and Paints

Dye Industry

- Spent Acids (mainly: dilute sulfuric, mixed acids, nitric and hydrochloric acid)
- Spent Solvents, Oils, and Paints

Electrolytic (Battery Industry)

- Spent Sulfuric Acid with Lead
- Nickel and Cadmium Wastes
- Spent Solvents, Oils, and Paints

Electrical Manufacturers

- Plating Wastes
- Spent Acids
- Spent Solvents, Oils, and Paints

Electronic Components

- Electrolysis Nickel and Copper Plating Wastes
- Spent Precious Metal Plating Wastewaters
- Hydrofluoric Acid
- Spent Solvents, Oils, and Paints

Table 3 (continued)

Glass Industry

- Arsenic and Lead Baring Wastes
- Spent Solvents, Oils, and Paints

Industrial Cleaning Services

- Acid Descaling
- Caustic Oily waste
- Boiler Treatment Heavy Metal Bearing Waste
- Spent Solvents, Oils, and Paints

Metal Finishing

- Pickling Liquors
- Oily Wastewaters
- Spent Chromic Acid Wastes
- Plating Wastes
- Spent Solvents, Oils, and Paints

Metal Fabrication

- Spent Cutting Fluids
- Oily Wastewaters
- Spent Pickling Acids
- Spent Solvents, Oils, and Paints

Petrochemical and Petroleum

- Spent Caustic
- API Separator Wastewaters
- Contaminated Cooling Waters
- Spent Solvents, Oils, and Paints

Photographic

- Silver Recovery Wastewaters
- Wastewaters Containing Arsenic and Selenium
- Spent Caustic
- Spent Solvents, Oils, and Paints

Paint

- Process Wastewaters
- Latex Water Based Wastes
- Chromate Wastes
- Spent Solvents, Oils, and Paints

Table 3 (continued)

Pigment Industries

- o Spent Sulfuric Acids
- o Heavy Metal Containing Wastewaters
- o Spent Solvents, Oils, and Paints

Soap and Detergent

- o Animal Oil-Water Emulsions

Tanning

- o Process Water Contaminated with Animal Fats, Oils and Greases

Steel

- o Wastewater Contaminated with Rolling Oils
- o Contaminated Cooling Waters
- o Wet Scrubber Wastes
- o Spent Solvents, Oils, and Paints

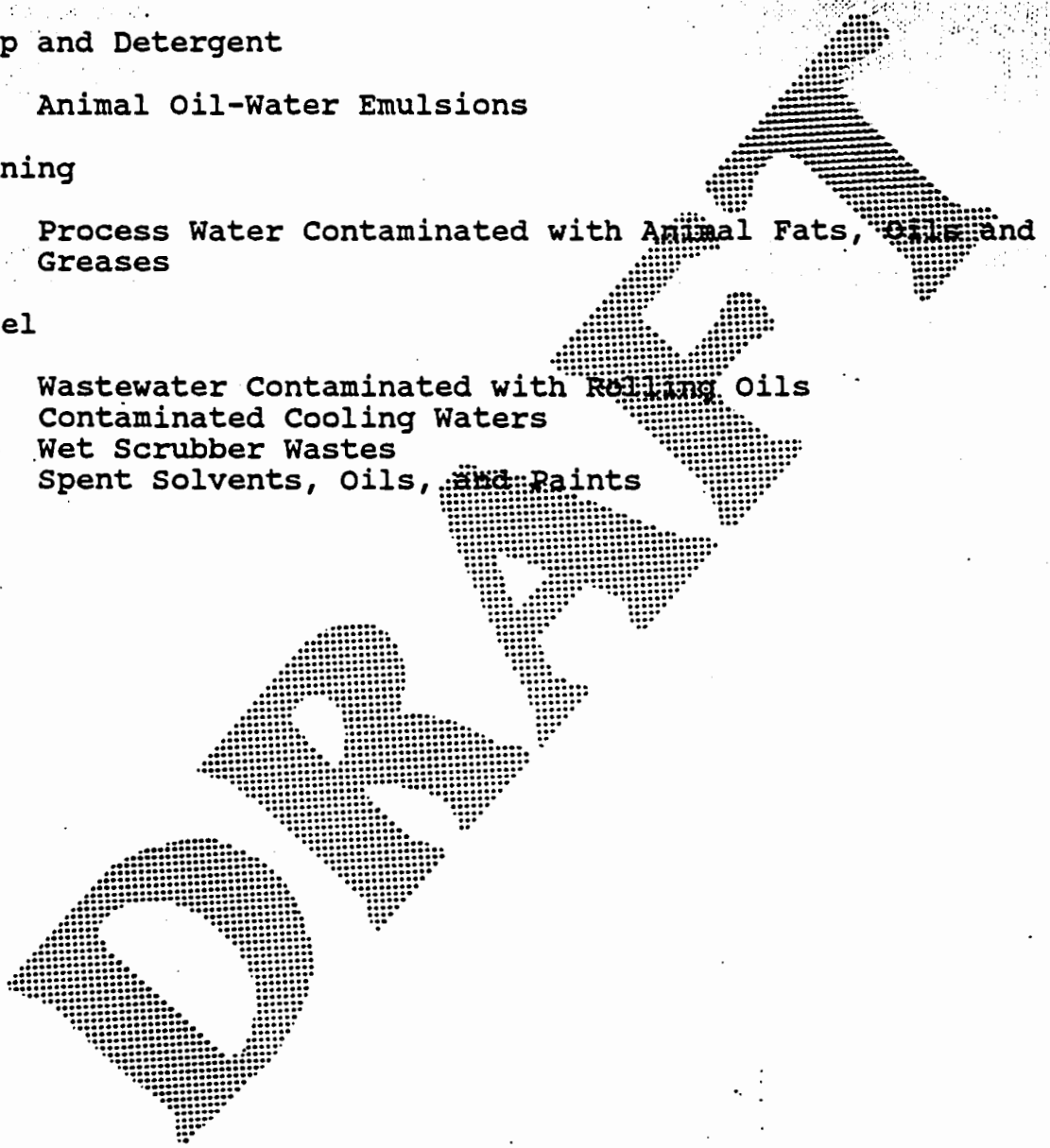


Table 4

Scientific Notation

$10^{-9} = 1/1,000,000,000$
$10^{-8} = 1/100,000,000$
$10^{-7} = 1/10,000,000$
$10^{-6} = 1/1,000,000$
$10^{-5} = 1/100,000$
$10^{-4} = 1/10,000$
$10^{-3} = 1/1,000$
$10^{-2} = 1/100$
$10^{-1} = 1/10$
$10^{0} = 1$
$10^{1} = 10$
$10^{2} = 100$
$10^{3} = 1,000$
$10^{4} = 10,000$
$10^{5} = 100,000$
$10^{6} = 1,000,000$

e.g. $3.56 \times 10^{4} = 3.56 \times 10,000 = 35,600$
$8.25 \times 10^{-3} = 8.25 \times 1/1000 = 0.00825$

Table 5

Summary of Emissions to Ambient Air

Hexavalent Chromium	- 9.30×10^{-9}	grams/second
Trichloroethane	- 9.66×10^{-5}	grams/second
Benzene	- 2.85×10^{-5}	grams/second

Table 6

Downwind Maximum Concentration of Carcinogens (2)

Hexavalent Chromium - 7.6×10^{-7} micrograms/meter^3
Trichloroethane - 8.0×10^{-3} micrograms/meter^3
Benzene - 2.2×10^{-3} micrograms/meter^3

---

(2) The printouts of the computer program output for each of the three carcinogenic substances is included as Appendix A of this report.

Table 7

Unit Risk Values (3)

Hexavalent Chromium	$- 1.5 \times 10^{-1}$
1,1,2-Trichloroethane	$- 1.6 \times 10^{-5}$
Benzene	$- 5.3 \times 10^{-5}$

(3) A unit risk value is an individual's probability of contracting cancer when exposed to one microgram per cubic meter of an air contaminated over a lifetime exposure (70 years) through the inhalation pathway.

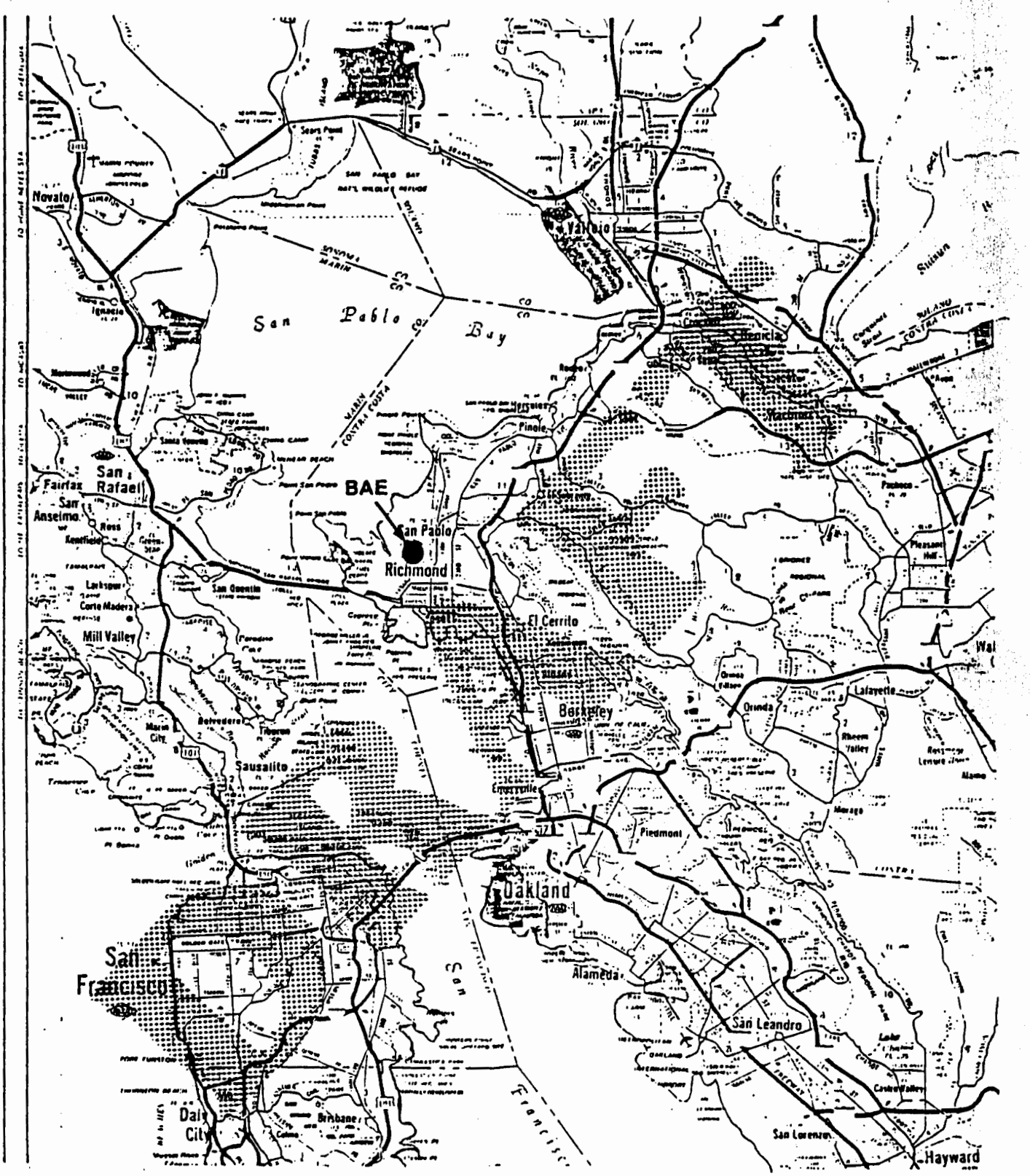
Table 8

Cancer Risk

	Maximum Concentration Microgram/m^3	Unit Risk Value	Concentration times URV
Hexavalent Chromium	7.6×10^{-7}	1.5×10^{-1}	1.14×10^{-7}
1,1,2-Trichloroethane	8.0×10^{-3}	1.6×10^{-5}	1.28×10^{-7}
Benzene	2.2×10^{-3}	5.3×10^{-8}	1.17×10^{-7}
		Total Cancer Risk	3.59×10^{-7}

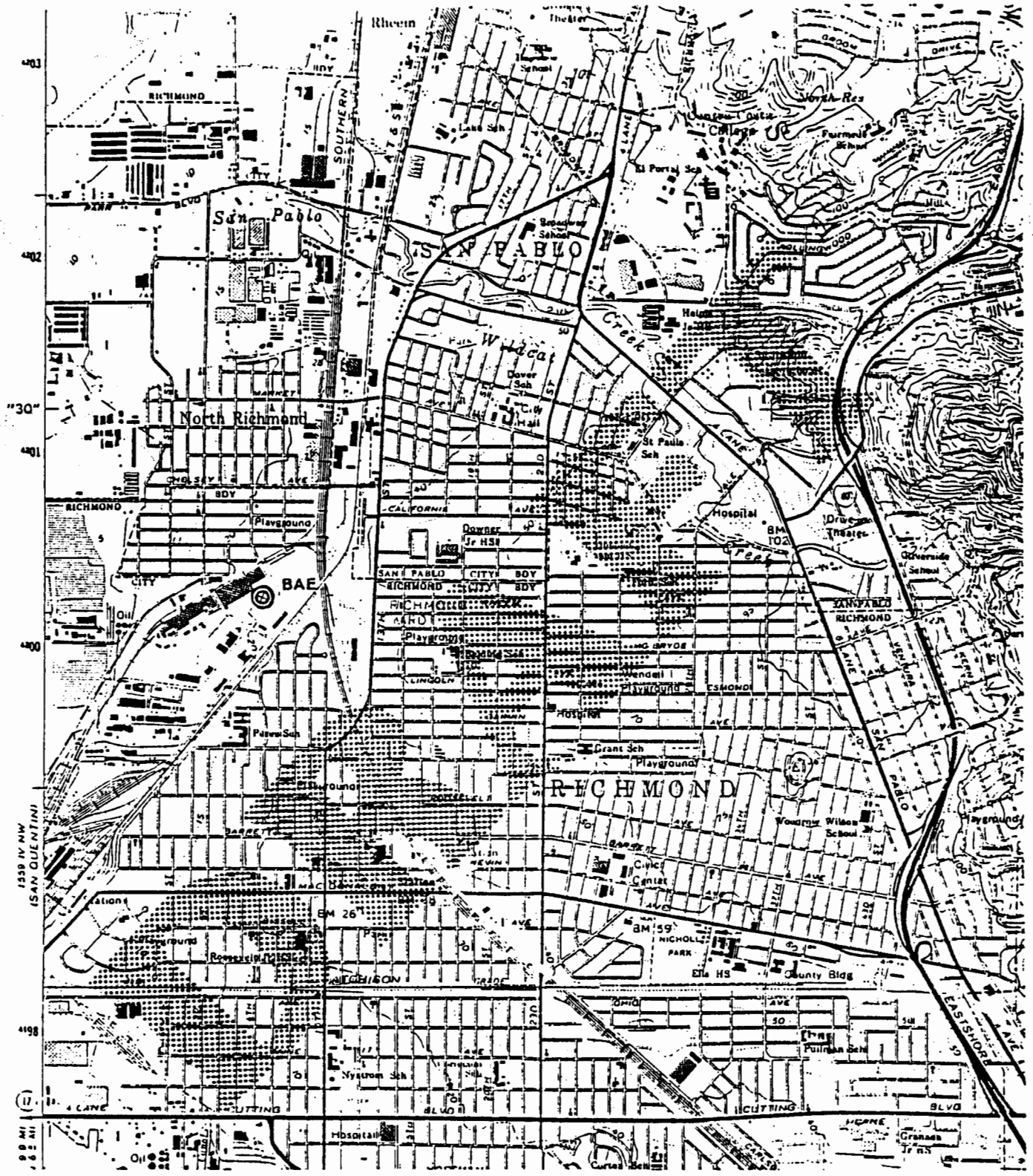
APPENDIX A

Computer Printout



General Location

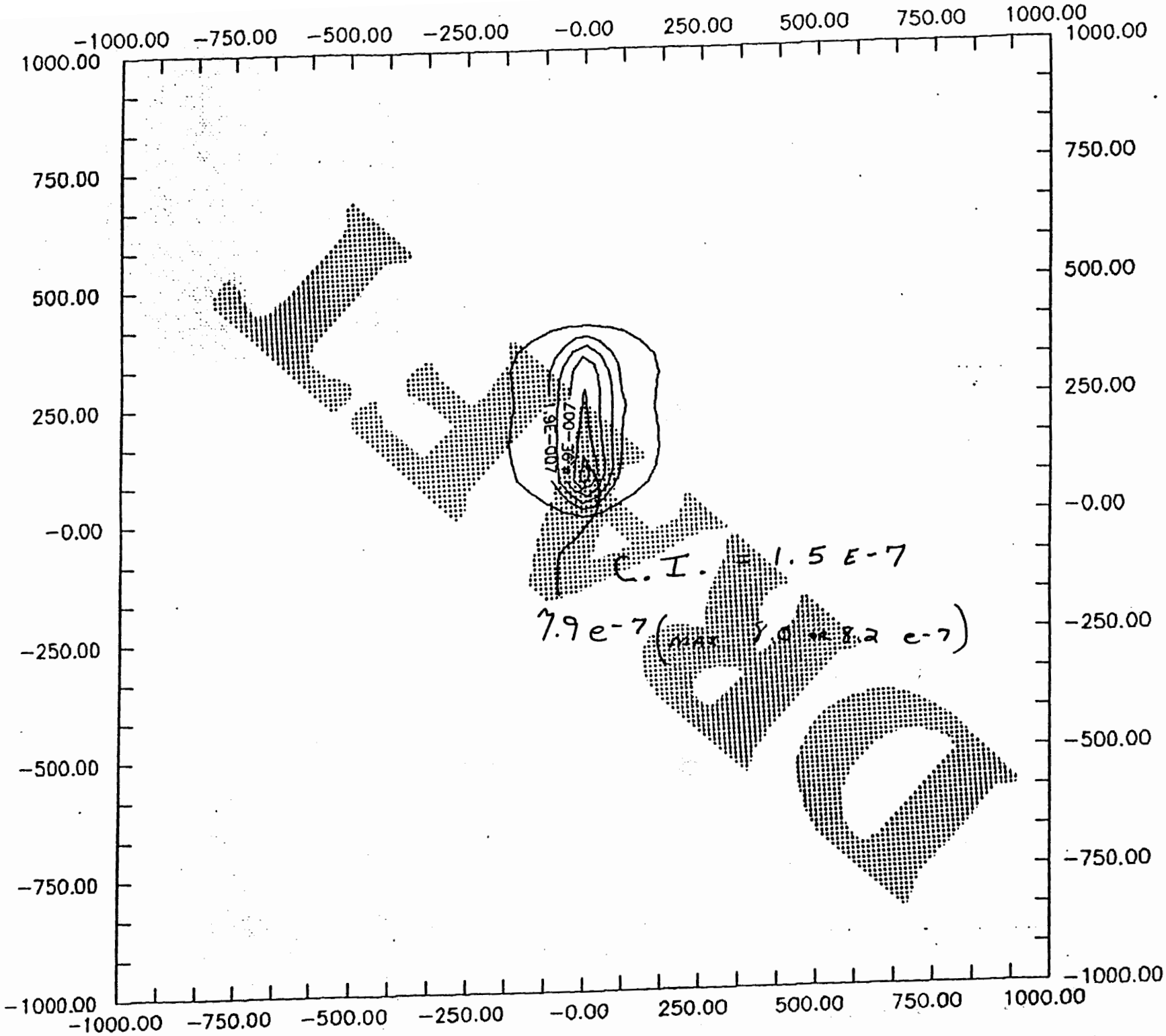
ATT Aqua Terra Technologies Consulting Engineers & Scientists	Bay Area Environ	PLATE
	JOB NUMBER 9002	DATE 4/89
		1



Local Topography And Other Details

ATT Aqua Terra Technologies
Consulting Engineers
& Scientists

Bay Area Environ		PLATE
JOB NUMBER	DATE	2
9002	4/89	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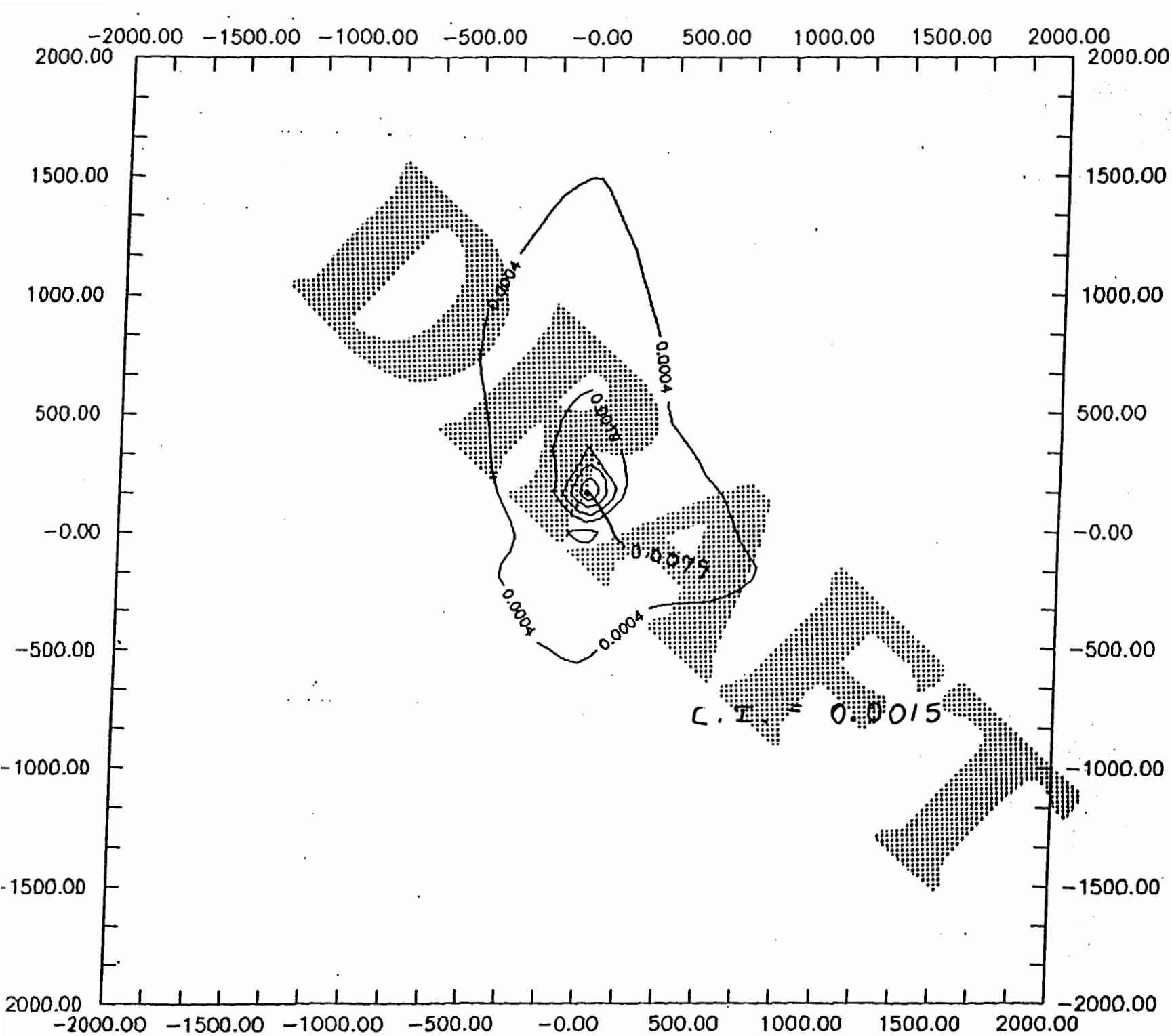
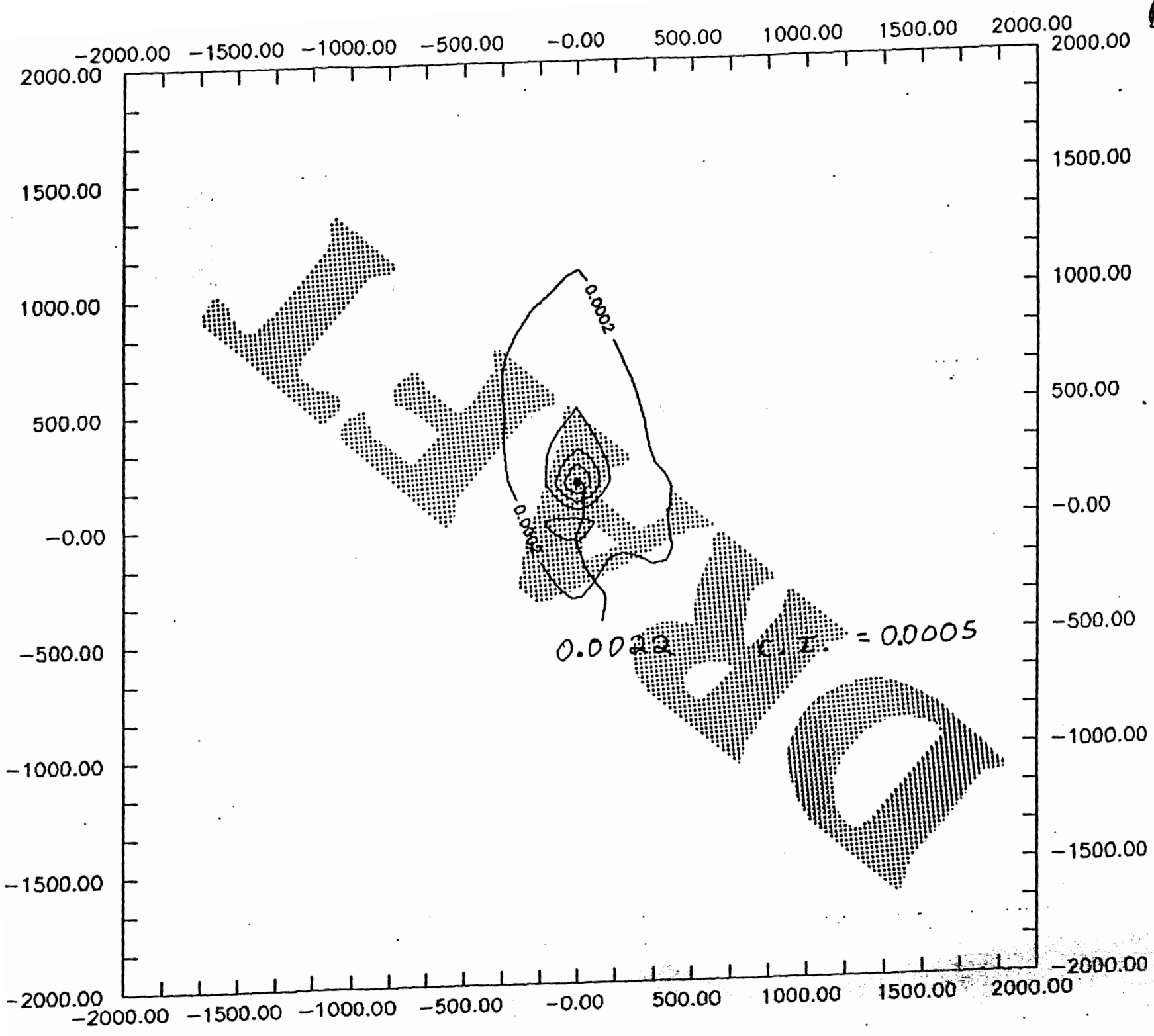
-750.00
-500.00
-250.00
-0.00
250.00
500.00
750.00
1000.00
1.9E-007
C.I. = 1.5 e-7
7.9 e-7 (max. = 8.2 e-7)


TCA
-2000.00 -1500.00 -1000.00 -500.00 -0.00 500.00 1000.00 1500.00 2000.00
2000.00
1500.00
1000.00
500.00
-0.00
-500.00
-1000.00
-1500.00
0.0004
0.0004
0.0004
0.0004
0.0004
C.I. = 0.0015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-1500.00
-1000.00
-500.00
-0.00
500.00
1000.00
1500.00
2000.00
0.002
0.0025
0.0025 C.I. = 0.0005

```
1                    ISCLT (DATED 8735.
                     AN AIR QUALITY DISPERSION MODEL IN
                     SECTION 1.  GUIDELINE MODELS
                     IN UNAMAP (VERSION 6) JAN. 88.
                     BOWMAN ENVIRONMENTAL ENGINEERING  VERSION 6.3.


                            SESSION INFORMATION

                     INPUT DATA FILE NAME :  BAETCA.DTA
                     OUTPUT LIST FILE NAME : BAETCA.LST


1**** ISCLT ************* BAY AREA ENVIRONMENTAL - TRICHLOROETHANE                                    ******** PAGE      1 ***

 *** WARNING - FREQ. OF OCCURRENCE OF SPD VS. DIR IS NOT 1.0 FOR SEASON  1, PROG. DIVIDES BY   0.78773 TO NORMALIZE
                                        - ISCLT INPUT DATA -

          NUMBER OF SOURCES =   1
          NUMBER OF X AXIS GRID SYSTEM POINTS =   21
          NUMBER OF Y AXIS GRID SYSTEM POINTS =   21
          NUMBER OF SPECIAL POINTS =    0
          NUMBER OF SEASONS =   1
          NUMBER OF WIND SPEED CLASSES =   6
          NUMBER OF STABILITY CLASSES =   6
          NUMBER OF WIND DIRECTION CLASSES =  16
          FILE NUMBER OF DATA FILE USED FOR REPORTS =   1
          THE PROGRAM IS RUN IN RURAL MODE
          CONCENTRATION (DEPOSITION) UNITS CONVERSION FACTOR =0.10000000E+07
          ACCELERATION OF GRAVITY (METERS/SEC**2) =  9.800
          HEIGHT OF MEASUREMENT OF WIND SPEED (METERS) =  10.000
          CORRECTION ANGLE FOR GRID SYSTEM VERSUS DIRECTION DATA NORTH (DEGREES) =   0.000
          DECAY COEFFICIENT =0.00000000E+00
          PROGRAM OPTION SWITCHES = 1, 1, 1, 0, 0, 3, 2, 1, 3, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 1, 1, 1, 0,
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             1200.00,    1400.00,    1600.00,    1800.00,    2000.00,
         DISTANCE Y AXIS GRID SYSTEM POINTS (METERS )=   -2000.00,   -1800.00,   -1600.00,   -1400.00,   -1200.00,   -1000.00,
             -800.00,    -600.00,    -400.00,    -200.00,       0.00,     200.00,     400.00,     600.00,     800.00,    1000.00,
             1200.00,    1400.00,    1600.00,    1800.00,    2000.00,
0                           - AMBIENT AIR TEMPERATURE (DEGREES KELVIN) -

                    STABILITY  STABILITY  STABILITY  STABILITY  STABILITY  STABILITY
                    CATEGORY 1 CATEGORY 2 CATEGORY 3 CATEGORY 4 CATEGORY 5 CATEGORY 6
           SEASON  1   293.0000   293.0000   293.0000   293.0000   293.0000   293.0000
0                                  - MIXING LAYER HEIGHT (METERS) -

                                                SEASON 1
                      WIND SPEED  WIND SPEED  WIND SPEED  WIND SPEED  WIND SPEED  WIND SPEED
                      CATEGORY 1  CATEGORY 2  CATEGORY 3  CATEGORY 4  CATEGORY 5  CATEGORY 6
 STABILITY CATEGORY 10.500000E+040.500000E+040.500000E+040.500000E+040.500000E+040.500000E+04
 STABILITY CATEGORY 20.500000E+040.500000E+040.500000E+040.500000E+040.500000E+040.500000E+04
 STABILITY CATEGORY 30.225000E+040.225000E+040.225000E+040.225000E+040.225000E+040.225000E+04
 STABILITY CATEGORY 40.225000E+040.225000E+040.225000E+040.225000E+040.225000E+040.225000E+04
 STABILITY CATEGORY 50.100000E+050.100000E+050.100000E+050.100000E+050.100000E+050.100000E+05
 STABILITY CATEGORY 60.100000E+050.100000E+050.100000E+050.100000E+050.100000E+050.100000E+05
1**** ISCLT ************* BAY AREA ENVIRONMENTAL - TRICHLOROETHANE                                    ******** PAGE      2 ****

                                        - ISCLT INPUT DATA (CONT.) -

0                       - FREQUENCY OF OCCURRENCE OF WIND SPEED, DIRECTION AND STABILITY -
```

DIRECTION (DEGREES)	WIND SPEED CATEGORY 1 (1.5000MPS)	WIND SPEED CATEGORY 2 (2.50 PS)	WIND SPEED CATEGORY 3 (4.3000MPS)	WIND SPEED CATEGORY 4 (6.8000MPS)	WIND SPEED CATEGORY 5 (9.5000MPS)	WIND SPEED CATEGORY 6 (12 .000MPS)
0.000	0.00050779	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
22.500	0.00005078	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
45.000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
67.500	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
90.000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
112.500	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
135.000	0.00005078	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
157.500	0.00134564	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
180.000	0.00106635	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
202.500	0.00062204	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
225.000	0.00027928	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
247.500	0.00005078	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
270.000	0.00050779	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
292.500	0.00016503	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
315.000	0.00039354	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
337.500	0.00055857	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000

0 SEASON 1

0 STABILITY CATEGORY 2

DIRECTION (DEGREES)	WIND SPEED CATEGORY 1 (1.5000MPS)	WIND SPEED CATEGORY 2 (2.5000MPS)	WIND SPEED CATEGORY 3 (4.3000MPS)	WIND SPEED CATEGORY 4 (6.8000MPS)	WIND SPEED CATEGORY 5 (9.5000MPS)	WIND SPEED CATEGORY 6 (12.5000MPS)
0.000	0.00455740	0.00201846	0.00000000	0.00000000	0.00000000	0.00000000
22.500	0.00140911	0.00062204	0.00000000	0.00000000	0.00000000	0.00000000
45.000	0.00021581	0.00050779	0.00000000	0.00000000	0.00000000	0.00000000
67.500	0.00039354	0.00073629	0.00000000	0.00000000	0.00000000	0.00000000
90.000	0.00016503	0.00062204	0.00000000	0.00000000	0.00000000	0.00000000
112.500	0.00005078	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
135.000	0.00034276	0.00129486	0.00000000	0.00000000	0.00000000	0.00000000
157.500	0.00601729	0.01068894	0.00000000	0.00000000	0.00000000	0.00000000
180.000	0.00696939	0.01647772	0.00000000	0.00000000	0.00000000	0.00000000
202.500	0.00201846	0.00698209	0.00000000	0.00000000	0.00000000	0.00000000
225.000	0.00050779	0.00112983	0.00000000	0.00000000	0.00000000	0.00000000
247.500	0.00044431	0.00050779	0.00000000	0.00000000	0.00000000	0.00000000
270.000	0.00022850	0.00106635	0.00000000	0.00000000	0.00000000	0.00000000
292.500	0.00033006	0.00152336	0.00000000	0.00000000	0.00000000	0.00000000
315.000	0.00090132	0.00118061	0.00000000	0.00000000	0.00000000	0.00000000
337.500	0.00326254	0.00147259	0.00000000	0.00000000	0.00000000	0.00000000

- ISCLT INPUT DATA (CONT.) -

0 - FREQUENCY OF OCCURRENCE OF WIND SPEED, DIRECTION AND STABILITY -

0 SEASON 1

0 STABILITY CATEGORY 3

DIRECTION (DEGREES)	WIND SPEED CATEGORY 1 (1.5000MPS)	WIND SPEED CATEGORY 2 (2.5000MPS)	WIND SPEED CATEGORY 3 (4.3000MPS)	WIND SPEED CATEGORY 4 (6.8000MPS)	WIND SPEED CATEGORY 5 (9.5000MPS)	WIND SPEED CATEGORY 6 (12.5000MPS)
0.000	0.00652508	0.00444315	0.00011425	0.00000000	0.00000000	0.00000000
22.500	0.00410039	0.00311020	0.00000000	0.00000000	0.00000000	0.00000000
45.000	0.00157414	0.00291978	0.00016503	0.00000000	0.00000000	0.00000000
67.500	0.00147259	0.00547142	0.00005078	0.00000000	0.00000000	0.00000000
90.000	0.00095210	0.00360529	0.00000000	0.00000000	0.00000000	0.00000000
112.500	0.00016503	0.00011425	0.00000000	0.00000000	0.00000000	0.00000000
135.000	0.00095210	0.00501441	0.00016503	0.00000000	0.00000000	0.00000000
157.500	0.00410039	0.02165716	0.00163762	0.00005078	0.00000000	0.00000000

270.000	0.00027928	0.00331332	0.00000000	0.00000000	0.00000000	0.00000000
292.500	0.00162492	0.00[illegible]11	0.00027928	0.00000000	0.00000000	0.00000000
315.000	0.00050779	0.00[illegible]046	0.00011425	0.00000000	0.00000000	0.00000000
337.500	0.00291978	0.00224696	0.00005078	0.00000000	0.00000000	0.00000000

0 SEASON 1
0 STABILITY CATEGORY 4

DIRECTION (DEGREES)	WIND SPEED CATEGORY 1 (1.5000MPS)	WIND SPEED CATEGORY 2 (2.5000MPS)	WIND SPEED CATEGORY 3 (4.3000MPS)	WIND SPEED CATEGORY 4 (6.8000MPS)	WIND SPEED CATEGORY 5 (9.5000MPS)	WIND SPEED CATEGORY 6 (12.5000MPS)
0.000	0.00314829	0.00321176	0.00219618	0.00005078	0.00000000	0.00000000
22.500	0.00399883	0.00196768	0.00185343	0.00011425	0.00000000	0.00000000
45.000	0.00472243	0.00421464	0.00016503	0.00000000	0.00000000	0.00000000
67.500	0.00596651	0.01023193	0.00112983	0.00000000	0.00000000	0.00000000
90.000	0.00337679	0.00432889	0.00045701	0.00000000	0.00000000	0.00000000
112.500	0.00034276	0.00016503	0.00005078	0.00000000	0.00000000	0.00000000
135.000	0.00201846	0.00776916	0.00270397	0.00011425	0.00000000	0.00000000
157.500	0.01013037	0.04170210	0.02188567	0.00355452	0.00027928	0.00000000
180.000	0.01995607	0.09145262	0.04790980	0.00500171	0.00090132	0.00000000
202.500	0.00291978	0.02936284	0.01591915	0.00286900	0.00027928	0.00000000
225.000	0.00309751	0.01788683	0.01047313	0.00151067	0.00011425	0.00000000
247.500	0.00524291	0.02612569	0.00636005	0.00039354	0.00067282	0.00000000
270.000	0.00552219	0.01105708	0.00224696	0.00005078	0.00000000	0.00000000
292.500	0.00608076	0.01626191	0.00746448	0.00044431	0.00000000	0.00000000
315.000	0.00129486	0.00371955	0.00213271	0.00016503	0.00000000	0.00000000
337.500	0.00134564	0.00236121	0.00544603	0.00062204	0.00000000	0.00000000

- ISCLT INPUT DATA (CONT.) -

0 - FREQUENCY OF OCCURRENCE OF WIND SPEED, DIRECTION AND STABILITY -
0 SEASON 1
0 STABILITY CATEGORY 5

DIRECTION (DEGREES)	WIND SPEED CATEGORY 1 (1.5000MPS)	WIND SPEED CATEGORY 2 (2.5000MPS)	WIND SPEED CATEGORY 3 (4.3000MPS)	WIND SPEED CATEGORY 4 (6.8000MPS)	WIND SPEED CATEGORY 5 (9.5000MPS)	WIND SPEED CATEGORY 6 (12.5000MPS)
0.000	0.00258972	0.00523022	0.00000000	0.00000000	0.00000000	0.00000000
22.500	0.00241199	0.00342757	0.00000000	0.00000000	0.00000000	0.00000000
45.000	0.00145989	0.00247547	0.00000000	0.00000000	0.00000000	0.00000000
67.500	0.00252625	0.00201846	0.00000000	0.00000000	0.00000000	0.00000000
90.000	0.00264050	0.00073629	0.00000000	0.00000000	0.00000000	0.00000000
112.500	0.00016503	0.00022850	0.00000000	0.00000000	0.00000000	0.00000000
135.000	0.00134564	0.00501441	0.00000000	0.00000000	0.00000000	0.00000000
157.500	0.00630927	0.01726479	0.00000000	0.00000000	0.00000000	0.00000000
180.000	0.00826425	0.03982328	0.00000000	0.00000000	0.00000000	0.00000000
202.500	0.00157414	0.00349104	0.00000000	0.00000000	0.00000000	0.00000000
225.000	0.00124408	0.00198037	0.00000000	0.00000000	0.00000000	0.00000000
247.500	0.00314829	0.00332601	0.00000000	0.00000000	0.00000000	0.00000000
270.000	0.00434159	0.00696939	0.00000000	0.00000000	0.00000000	0.00000000
292.500	0.00523022	0.01713785	0.00000000	0.00000000	0.00000000	0.00000000
315.000	0.00057126	0.00321176	0.00000000	0.00000000	0.00000000	0.00000000
337.500	0.00095210	0.00568723	0.00000000	0.00000000	0.00000000	0.00000000

0 SEASON 1
0 STABILITY CATEGORY 6

DIRECTION (DEGREES)	WIND SPEED CATEGORY 1 (1.5000MPS)	WIND SPEED CATEGORY 2 (2.5000MPS)	WIND SPEED CATEGORY 3 (4.3000MPS)	WIND SPEED CATEGORY 4 (6.8000MPS)	WIND SPEED CATEGORY 5 (9.5000MPS)	WIND SPEED CATEGORY 6 (12.5000MPS)
0.000	0.00742640	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000

90.000	0.00085054	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
112.500	0.00050779	0.00000	0.00000000	0.00000000	0.00000000	0.00000
135.000	0.00624579	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
157.500	0.01828037	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
180.000	0.01956253	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
202.500	0.00112983	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
225.000	0.00085054	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
247.500	0.00180265	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
270.000	0.00608076	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
292.500	0.01244081	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
315.000	0.00173917	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
337.500	0.00252625	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000

- ISCLT INPUT DATA (CONT.) -

0 - VERTICAL POTENTIAL TEMPERATURE GRADIENT (DEGREES KELVIN/METER) -

	WIND SPEED CATEGORY 1	WIND SPEED CATEGORY 2	WIND SPEED CATEGORY 3	WIND SPEED CATEGORY 4	WIND SPEED CATEGORY 5	WIND SPEED CATEGORY 6
STABILITY CATEGORY 1	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00
STABILITY CATEGORY 2	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00
STABILITY CATEGORY 3	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00
STABILITY CATEGORY 4	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00
STABILITY CATEGORY 5	0.200000E-01	0.200000E-01	0.200000E-01	0.200000E-01	0.200000E-01	0.200000E-01
STABILITY CATEGORY 6	0.350000E-01	0.350000E-01	0.350000E-01	0.350000E-01	0.350000E-01	0.350000E-01

0 - WIND PROFILE POWER LAW EXPONENTS -

	WIND SPEED CATEGORY 1	WIND SPEED CATEGORY 2	WIND SPEED CATEGORY 3	WIND SPEED CATEGORY 4	WIND SPEED CATEGORY 5	WIND SPEED CATEGORY 6
STABILITY CATEGORY 1	0.700000E-01	0.700000E-01	0.700000E-01	0.700000E-01	0.700000E-01	0.700000E-01
STABILITY CATEGORY 2	0.700000E-01	0.700000E-01	0.700000E-01	0.700000E-01	0.700000E-01	0.700000E-01
STABILITY CATEGORY 3	0.100000E+00	0.100000E+00	0.100000E+00	0.100000E+00	0.100000E+00	0.100000E+00
STABILITY CATEGORY 4	0.150000E+00	0.150000E+00	0.150000E+00	0.150000E+00	0.150000E+00	0.150000E+00
STABILITY CATEGORY 5	0.350000E+00	0.350000E+00	0.350000E+00	0.350000E+00	0.350000E+00	0.350000E+00
STABILITY CATEGORY 6	0.550000E+00	0.550000E+00	0.550000E+00	0.550000E+00	0.550000E+00	0.550000E+00

- SOURCE INPUT DATA -

C A R D	T A P E	SOURCE NUMBER	SOURCE TYPE	X COORDINATE (M)	Y COORDINATE (M)	EMISSION HEIGHT (M)	BASE ELEV- ATION (M)	- SOURCE DETAILS DEPENDING ON TYPE -
X		1	STACK	0.00	0.00	7.00	0.00	GAS EXIT TEMP (DEG K)= 295.00, GAS EXIT VEL. (M/SEC)= 0.01, STACK DIAMETER (M)= 0.000, HEIGHT OF ASSO. BLDG. (M)= 0.00, WIDTH OF ASSO. BLDG. (M)= 0.00, WAKE EFFECTS FLAG = 0

- SOURCE STRENGTHS (GRAMS PER SEC) -

SEASON 1	SEASON 2	SEASON 3	SEASON 4
9.66000E-05			

WARNING - DISTANCE BETWEEN SOURCE 1 AND POINT X,Y= 0.00, 0.00 IS LESS THAN PERMITTED

** ANNUAL GROUND LEVEL CONCENTRATION (MICROGRAMS PER CUBIC METER) DUE TO SOURCE 1 **

- GRID SYSTEM RECEPTORS -

- X AXIS (DISTANCE, METERS) -

Y AXIS (DISTANCE , METERS) - CONCENTRATION -	-2000.000	-1800.000	-1600.000	-1400.000	-1200.000	-1000.000	-800.000	-600.000	-400.000

1400.000	0.000017	0.000022	0.000030	0.000039	0.000071	0.[illegible]113	0.000167	0.000235	0.000317
1200.000	0.000013	0.000018	0.000026	0.000036	0.000050	0.[illegible]099	0.000166	0.000256	0.000366
1000.000	0.000006	0.000013	0.000020	0.000030	0.000045	0.000068	0.000149	0.000267	0.000430
800.000	0.000003	0.000005	0.000011	0.000021	0.000035	0.000059	0.000096	0.000250	0.000495
600.000	0.000006	0.000006	0.000005	0.000006	0.000018	0.000039	0.000078	0.000153	0.000516
400.000	0.000010	0.000011	0.000012	0.000012	0.000012	0.000009	0.000034	0.000107	0.000293
200.000	0.000014	0.000016	0.000019	0.000022	0.000027	0.000032	0.000037	0.000037	0.000101
0.000	0.000018	0.000022	0.000026	0.000033	0.000042	0.000056	0.000083	0.000135	0.000262
-200.000	0.000023	0.000027	0.000034	0.000043	0.000058	0.000081	0.000124	0.000214	0.000400
-400.000	0.000026	0.000032	0.000040	0.000051	0.000068	0.000094	0.000129	0.000181	0.000252
-600.000	0.000029	0.000035	0.000043	0.000055	0.000067	0.000083	0.000105	0.000132	0.000195
-800.000	0.000031	0.000036	0.000042	0.000049	0.000059	0.000070	0.000083	0.000111	0.000147
-1000.000	0.000029	0.000033	0.000038	0.000044	0.000051	0.000058	0.000074	0.000092	0.000113
-1200.000	0.000027	0.000031	0.000034	0.000039	0.000044	0.000053	0.000064	0.000077	0.000090
-1400.000	0.000025	0.000028	0.000031	0.000034	0.000040	0.000048	0.000056	0.000064	0.000073
-1600.000	0.000023	0.000025	0.000028	0.000032	0.000037	0.000042	0.000048	0.000055	0.000060
-1800.000	0.000021	0.000023	0.000026	0.000030	0.000034	0.000038	0.000042	0.000047	0.000051
-2000.000	0.000019	0.000022	0.000025	0.000027	0.000031	0.000034	0.000037	0.000040	0.000043

- GRID SYSTEM RECEPTORS -
- X AXIS (DISTANCE, METERS) -

Y AXIS (DISTANCE, METERS)	-200.000	0.000	200.000	400.000	600.000	800.000	1000.000	1200.000	1400.000
	- CONCENTRATION -								
2000.000	0.000232	0.000258	0.000205	0.000152	0.000100	0.000053	0.000041	0.000035	0.000030
1800.000	0.000271	0.000307	0.000237	0.000167	0.000100	0.000053	0.000045	0.000038	0.000032
1600.000	0.000323	0.000372	0.000277	0.000182	0.000093	0.000060	0.000049	0.000040	0.000033
1400.000	0.000392	0.000462	0.000327	0.000193	0.000083	0.000067	0.000053	0.000042	0.000033
1200.000	0.000487	0.000593	0.000391	0.000195	0.000096	0.000075	0.000057	0.000043	0.000041
1000.000	0.000621	0.000796	0.000471	0.000167	0.000112	0.000081	0.000057	0.000054	0.000050
800.000	0.000836	0.001164	0.000574	0.000192	0.000127	0.000083	0.000077	0.000069	0.000061
600.000	0.001156	0.001886	0.000633	0.000243	0.000135	0.000118	0.000101	0.000085	0.000073
400.000	0.001522	0.003609	0.000637	0.000271	0.000219	0.000167	0.000129	0.000101	0.000082
200.000	0.000764	0.009303	0.000825	0.000534	0.000321	0.000209	0.000148	0.000112	0.000089
0.000	0.000685	0.000000	0.001542	0.000668	0.000361	0.000227	0.000157	0.000118	0.000092
-200.000	0.000653	0.001482	0.000375	0.000854	0.000544	0.000324	0.000214	0.000155	0.000118
-400.000	0.000432	0.000623	0.000283	0.000133	0.000297	0.000287	0.000246	0.000179	0.000136
-600.000	0.000274	0.000334	0.000198	0.000115	0.000068	0.000136	0.000153	0.000150	0.000140
-800.000	0.000185	0.000209	0.000145	0.000090	0.000063	0.000042	0.000080	0.000094	0.000097
-1000.000	0.000132	0.000144	0.000109	0.000072	0.000054	0.000040	0.000030	0.000052	0.000063
-1200.000	0.000101	0.000107	0.000086	0.000063	0.000046	0.000037	0.000028	0.000022	0.000037

** ANNUAL GROUND LEVEL CONCENTRATION (MICROGRAMS PER CUBIC METER) DUE TO SOURCE 1 (CONT.) **

- GRID SYSTEM RECEPTORS -
- X AXIS (DISTANCE, METERS) -

Y AXIS (DISTANCE, METERS)	-200.000	0.000	200.000	400.000	600.000	800.000	1000.000	1200.000	1400.000
	- CONCENTRATION -								
-1400.000	0.000080	0.000084	0.000069	0.000054	0.000039	0.000033	0.000026	0.000021	0.000017
-1600.000	0.000065	0.000067	0.000057	0.000046	0.000036	0.000029	0.000024	0.000020	0.000017
-1800.000	0.000054	0.000056	0.000048	0.000040	0.000032	0.000026	0.000022	0.000019	0.000016
-2000.000	0.000045	0.000047	0.000041	0.000035	0.000029	0.000023	0.000020	0.000017	0.000015

- GRID SYSTEM RECEPTORS -
- X AXIS (DISTANCE, METERS) -

Y AXIS (DISTANCE, METERS)	1600.000	1800.000	2000.000

1 ISCLT (DATED 97352)
AN AIR QUALITY DISP .ON MODEL IN
SECTION 1. GUIDELINE MODELS
IN UNAMAP (VERSION 6) JAN. 88.
BOWMAN ENVIRONMENTAL ENGINEERING VERSION 6.3.

SESSION INFORMATION

INPUT DATA FILE NAME : BAEBENZ.DTA
OUTPUT LIST FILE NAME : BAEBENZ.LST

*** WARNING - FREQ. OF OCCURRENCE OF SPD VS. DIR IS NOT 1.0 FOR SEASON 1, PROG. DIVIDES BY 0.78773 TO NORMALIZE

- ISCLT INPUT DATA -

NUMBER OF SOURCES = 1
NUMBER OF X AXIS GRID SYSTEM POINTS = 21
NUMBER OF Y AXIS GRID SYSTEM POINTS = 21
NUMBER OF SPECIAL POINTS = 0
NUMBER OF SEASONS = 1
NUMBER OF WIND SPEED CLASSES = 6
NUMBER OF STABILITY CLASSES = 6
NUMBER OF WIND DIRECTION CLASSES = 16
FILE NUMBER OF DATA FILE USED FOR REPORTS = 1
THE PROGRAM IS RUN IN RURAL MODE
CONCENTRATION (DEPOSITION) UNITS CONVERSION FACTOR =0.10000000E+07
ACCELERATION OF GRAVITY (METERS/SEC**2) = 9.800
HEIGHT OF MEASUREMENT OF WIND SPEED (METERS) = 10.000
CORRECTION ANGLE FOR GRID SYSTEM VERSUS DIRECTION DATA NORTH (DEGREES) = 0.000
DECAY COEFFICIENT =0.00000000E+00
PROGRAM OPTION SWITCHES = 1, 1, 1, 0, 0, 3, 2, 1, 3, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 1, 1, 1, 0,
DISTANCE X AXIS GRID SYSTEM POINTS (METERS)= -2000.00, -1800.00, -1600.00, -1400.00, -1200.00, -1000.00,
-800.00, -600.00, -400.00, -200.00, 0.00, 200.00, 400.00, 600.00, 800.00, 1000.00,
1200.00, 1400.00, 1600.00, 1800.00, 2000.00,
DISTANCE Y AXIS GRID SYSTEM POINTS (METERS)= -2000.00, -1800.00, -1600.00, -1400.00, -1200.00, -1000.00,
-800.00, -600.00, -400.00, -200.00, 0.00, 200.00, 400.00, 600.00, 800.00, 1000.00,
1200.00, 1400.00, 1600.00, 1800.00, 2000.00,
0 - AMBIENT AIR TEMPERATURE (DEGREES KELVIN) -

	STABILITY CATEGORY 1	STABILITY CATEGORY 2	STABILITY CATEGORY 3	STABILITY CATEGORY 4	STABILITY CATEGORY 5	STABILITY CATEGORY 6
SEASON 1	293.0000	293.0000	293.0000	293.0000	293.0000	293.0000

0 - MIXING LAYER HEIGHT (METERS) -

SEASON 1

	WIND SPEED CATEGORY 1	WIND SPEED CATEGORY 2	WIND SPEED CATEGORY 3	WIND SPEED CATEGORY 4	WIND SPEED CATEGORY 5	WIND SPEED CATEGORY 6
STABILITY CATEGORY 1	0.500000E+04	0.500000E+04	0.500000E+04	0.500000E+04	0.500000E+04	0.500000E+04
STABILITY CATEGORY 2	0.500000E+04	0.500000E+04	0.500000E+04	0.500000E+04	0.500000E+04	0.500000E+04
STABILITY CATEGORY 3	0.225000E+04	0.225000E+04	0.225000E+04	0.225000E+04	0.225000E+04	0.225000E+04
STABILITY CATEGORY 4	0.225000E+04	0.225000E+04	0.225000E+04	0.225000E+04	0.225000E+04	0.225000E+04
STABILITY CATEGORY 5	0.100000E+05	0.100000E+05	0.100000E+05	0.100000E+05	0.100000E+05	0.100000E+05
STABILITY CATEGORY 6	0.100000E+05	0.100000E+05	0.100000E+05	0.100000E+05	0.100000E+05	0.100000E+05

- ISCLT INPUT DATA (CONT.) -

0 - FREQUENCY OF OCCURRENCE OF WIND SPEED, DIRECTION AND STABILITY -
0 SEASON 1
0 STABILITY CATEGORY 1

DIRECTION (DEGREES)	WIND SPEED CATEGORY 1 (1.5000MPS)	WIND SPEED CATEGORY 2 (2.5000MPS)	WIND SPEED CATEGORY 3 (4.3000MPS)	WIND SPEED CATEGORY 4 (6.8000MPS)	WIND SPEED CATEGORY 5 (9.5000MPS)	WIND SPEED CATEGORY 6 (12.5000MPS)
0.000	0.00050779	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
22.500	0.00005078	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
45.000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
67.500	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
90.000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
112.500	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
135.000	0.00005078	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
157.500	0.00134564	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
180.000	0.00106635	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
202.500	0.00062204	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
225.000	0.00027928	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
247.500	0.00005078	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
270.000	0.00050779	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
292.500	0.00016503	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
315.000	0.00039354	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
337.500	0.00055857	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000

0 SEASON 1

0 STABILITY CATEGORY 2

DIRECTION (DEGREES)	WIND SPEED CATEGORY 1 (1.5000MPS)	WIND SPEED CATEGORY 2 (2.5000MPS)	WIND SPEED CATEGORY 3 (4.3000MPS)	WIND SPEED CATEGORY 4 (6.8000MPS)	WIND SPEED CATEGORY 5 (9.5000MPS)	WIND SPEED CATEGORY 6 (12.5000MPS)
0.000	0.00455740	0.00201846	0.00000000	0.00000000	0.00000000	0.00000000
22.500	0.00140911	0.00062204	0.00000000	0.00000000	0.00000000	0.00000000
45.000	0.00021581	0.00050779	0.00000000	0.00000000	0.00000000	0.00000000
67.500	0.00039354	0.00073629	0.00000000	0.00000000	0.00000000	0.00000000
90.000	0.00016503	0.00062204	0.00000000	0.00000000	0.00000000	0.00000000
112.500	0.00005078	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
135.000	0.00034276	0.00129486	0.00000000	0.00000000	0.00000000	0.00000000
157.500	0.00601729	0.01068894	0.00000000	0.00000000	0.00000000	0.00000000
180.000	0.00696939	0.01647772	0.00000000	0.00000000	0.00000000	0.00000000
202.500	0.00201846	0.00698209	0.00000000	0.00000000	0.00000000	0.00000000
225.000	0.00050779	0.00112983	0.00000000	0.00000000	0.00000000	0.00000000
247.500	0.00044431	0.00050779	0.00000000	0.00000000	0.00000000	0.00000000
270.000	0.00022850	0.00106635	0.00000000	0.00000000	0.00000000	0.00000000
292.500	0.00033006	0.00152336	0.00000000	0.00000000	0.00000000	0.00000000
315.000	0.00090132	0.00118061	0.00000000	0.00000000	0.00000000	0.00000000
337.500	0.00326254	0.00147259	0.00000000	0.00000000	0.00000000	0.00000000

- ISCLT INPUT DATA (CONT.) -

0 - FREQUENCY OF OCCURRENCE OF WIND SPEED, DIRECTION AND STABILITY -

0 SEASON 1

0 STABILITY CATEGORY 3

DIRECTION (DEGREES)	WIND SPEED CATEGORY 1 (1.5000MPS)	WIND SPEED CATEGORY 2 (2.5000MPS)	WIND SPEED CATEGORY 3 (4.3000MPS)	WIND SPEED CATEGORY 4 (6.8000MPS)	WIND SPEED CATEGORY 5 (9.5000MPS)	WIND SPEED CATEGORY 6 (12.5000MPS)
0.000	0.00652508	0.00444315	0.00011425	0.00000000	0.00000000	0.00000000
22.500	0.00410039	0.00311020	0.00000000	0.00000000	0.00000000	0.00000000
45.000	0.00157414	0.00291978	0.00016503	0.00000000	0.00000000	0.00000000
67.500	0.00147259	0.00547142	0.00005078	0.00000000	0.00000000	0.00000000
90.000	0.00095210	0.00360529	0.00000000	0.00000000	0.00000000	0.00000000
112.500	0.00016503	0.00011425	0.00000000	0.00000000	0.00000000	0.00000000
135.000	0.00095210	0.00501441	0.00016503	0.00000000	0.00000000	0.00000000
157.500	0.00410039	0.02185716	0.00163762	0.00005078	0.00000000	0.00000000
180.000	0.00550950	0.03364096	0.00680436	0.00037270	0.00000000	0.00000000

270.000	0.00027928	0.00391332	0.00000000	0.00000000	0.00000000	0.00000000
292.500	0.00162492	0.00613 1	0.00027928	0.00000000	0.00000000	0. 10000
315.000	0.00050779	0.00201046	0.00011425	0.00000000	0.00000000	0.00000000
337.500	0.00291976	0.00224696	0.00005078	0.00000000	0.00000000	0.00000000

SEASON 1

STABILITY CATEGORY 4

DIRECTION (DEGREES)	WIND SPEED CATEGORY 1 (1.5000MPS)	WIND SPEED CATEGORY 2 (2.5000MPS)	WIND SPEED CATEGORY 3 (4.3000MPS)	WIND SPEED CATEGORY 4 (6.8000MPS)	WIND SPEED CATEGORY 5 (9.5000MPS)	WIND SPEED CATEGORY 6 (12.5000MPS)
0.000	0.00314829	0.00321176	0.00219618	0.00005078	0.00000000	0.00000000
22.500	0.00399883	0.00196768	0.00185343	0.00011425	0.00000000	0.00000000
45.000	0.00472243	0.00421464	0.00016503	0.00000000	0.00000000	0.00000000
67.500	0.00596651	0.01023193	0.00112983	0.00000000	0.00000000	0.00000000
90.000	0.00337679	0.00432889	0.00045701	0.00000000	0.00000000	0.00000000
112.500	0.00034276	0.00016503	0.00005078	0.00000000	0.00000000	0.00000000
135.000	0.00201846	0.00776916	0.00270397	0.00011425	0.00000000	0.00000000
157.500	0.01013037	0.04170210	0.02188567	0.00355452	0.00027928	0.00000000
180.000	0.01995607	0.09145262	0.04790980	0.00500171	0.00090132	0.00000000
202.500	0.00291978	0.02936284	0.01591915	0.00286900	0.00027928	0.00000000
225.000	0.00309751	0.01788683	0.01047313	0.00151067	0.00011425	0.00000000
247.500	0.00524291	0.02612569	0.00636005	0.00039354	0.00067282	0.00000000
270.000	0.00552219	0.01105708	0.00224696	0.00005078	0.00000000	0.00000000
292.500	0.00688076	0.01626191	0.00746448	0.00044431	0.00000000	0.00000000
315.000	0.00129486	0.00371955	0.00213271	0.00016503	0.00000000	0.00000000
337.500	0.00134564	0.00236121	0.00544603	0.00062204	0.00000000	0.00000000

- ISCLT INPUT DATA (CONT.) -

- FREQUENCY OF OCCURRENCE OF WIND SPEED, DIRECTION AND STABILITY -

SEASON 1

STABILITY CATEGORY 5

DIRECTION (DEGREES)	WIND SPEED CATEGORY 1 (1.5000MPS)	WIND SPEED CATEGORY 2 (2.5000MPS)	WIND SPEED CATEGORY 3 (4.3000MPS)	WIND SPEED CATEGORY 4 (6.8000MPS)	WIND SPEED CATEGORY 5 (9.5000MPS)	WIND SPEED CATEGORY 6 (12.5000MPS)
0.000	0.00258972	0.00523022	0.00000000	0.00000000	0.00000000	0.00000000
22.500	0.00241199	0.00342757	0.00000000	0.00000000	0.00000000	0.00000000
45.000	0.00145989	0.00247547	0.00000000	0.00000000	0.00000000	0.00000000
67.500	0.00252625	0.00201846	0.00000000	0.00000000	0.00000000	0.00000000
90.000	0.00264050	0.00073629	0.00000000	0.00000000	0.00000000	0.00000000
112.500	0.00016503	0.00022850	0.00000000	0.00000000	0.00000000	0.00000000
135.000	0.00134564	0.00501441	0.00000000	0.00000000	0.00000000	0.00000000
157.500	0.00630927	0.01726479	0.00000000	0.00000000	0.00000000	0.00000000
180.000	0.00826425	0.03982328	0.00000000	0.00000000	0.00000000	0.00000000
202.500	0.00157414	0.00349104	0.00000000	0.00000000	0.00000000	0.00000000
225.000	0.00124408	0.00198037	0.00000000	0.00000000	0.00000000	0.00000000
247.500	0.00314829	0.00332601	0.00000000	0.00000000	0.00000000	0.00000000
270.000	0.00434159	0.00696939	0.00000000	0.00000000	0.00000000	0.00000000
292.500	0.00523022	0.01713785	0.00000000	0.00000000	0.00000000	0.00000000
315.000	0.00057126	0.00321176	0.00000000	0.00000000	0.00000000	0.00000000
337.500	0.00095210	0.00568723	0.00000000	0.00000000	0.00000000	0.00000000

SEASON 1

STABILITY CATEGORY 6

DIRECTION (DEGREES)	WIND SPEED CATEGORY 1 (1.5000MPS)	WIND SPEED CATEGORY 2 (2.5000MPS)	WIND SPEED CATEGORY 3 (4.3000MPS)	WIND SPEED CATEGORY 4 (6.8000MPS)	WIND SPEED CATEGORY 5 (9.5000MPS)	WIND SPEED CATEGORY 6 (12.5000MPS)
0.000	0.00742640	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000

90.000	0.00085054	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
112.500	0.00050779	0.000[illegible]0	0.00000000	0.00000000	0.00000000	0.00000000
135.000	0.00624579	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
157.500	0.01828037	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
180.000	0.01956253	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
202.500	0.00112983	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
225.000	0.00085054	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
247.500	0.00180265	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
270.000	0.00608076	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
292.500	0.01244081	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
315.000	0.00173917	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
337.500	0.00252625	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000

- ISCLT INPUT DATA (CONT.) -

0 - VERTICAL POTENTIAL TEMPERATURE GRADIENT (DEGREES KELVIN/METER) -

	WIND SPEED CATEGORY 1	WIND SPEED CATEGORY 2	WIND SPEED CATEGORY 3	WIND SPEED CATEGORY 4	WIND SPEED CATEGORY 5	WIND SPEED CATEGORY 6
STABILITY CATEGORY 1	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00
STABILITY CATEGORY 2	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00
STABILITY CATEGORY 3	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00
STABILITY CATEGORY 4	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00
STABILITY CATEGORY 5	0.200000E-01	0.200000E-01	0.200000E-01	0.200000E-01	0.200000E-01	0.200000E-01
STABILITY CATEGORY 6	0.350000E-01	0.350000E-01	0.350000E-01	0.350000E-01	0.350000E-01	0.350000E-01

0 - WIND PROFILE POWER LAW EXPONENTS -

	WIND SPEED CATEGORY 1	WIND SPEED CATEGORY 2	WIND SPEED CATEGORY 3	WIND SPEED CATEGORY 4	WIND SPEED CATEGORY 5	WIND SPEED CATEGORY 6
STABILITY CATEGORY 1	0.700000E-01	0.700000E-01	0.700000E-01	0.700000E-01	0.700000E-01	0.700000E-01
STABILITY CATEGORY 2	0.700000E-01	0.700000E-01	0.700000E-01	0.700000E-01	0.700000E-01	0.700000E-01
STABILITY CATEGORY 3	0.100000E+00	0.100000E+00	0.100000E+00	0.100000E+00	0.100000E+00	0.100000E+00
STABILITY CATEGORY 4	0.150000E+00	0.150000E+00	0.150000E+00	0.150000E+00	0.150000E+00	0.150000E+00
STABILITY CATEGORY 5	0.350000E+00	0.350000E+00	0.350000E+00	0.350000E+00	0.350000E+00	0.350000E+00
STABILITY CATEGORY 6	0.550000E+00	0.550000E+00	0.550000E+00	0.550000E+00	0.550000E+00	0.550000E+00

- SOURCE INPUT DATA -

A R D	T P E	SOURCE NUMBER	SOURCE TYPE	X COORDINATE (M)	Y COORDINATE (M)	EMISSION HEIGHT (M)	BASE ELEV- ATION (M)	- SOURCE DETAILS DEPENDING ON TYPE -
X		1	STACK	0.00	0.00	7.00	0.00	GAS EXIT TEMP (DEG K)= 295.00, GAS EXIT VEL. (M/SEC)= 0.01, STACK DIAMETER (M)= 0.000, HEIGHT OF ASSO. BLDG. (M)= 0.00, WIDTH OF ASSO. BLDG. (M)= 0.00, WAKE EFFECTS FLAG = 0

- SOURCE STRENGTHS (GRAMS PER SEC) -

SEASON 1	SEASON 2	SEASON 3	SEASON 4
2.85000E-05			

WARNING - DISTANCE BETWEEN SOURCE 1 AND POINT X,Y= 0.00, 0.00 IS LESS THAN PERMITTED

** ANNUAL GROUND LEVEL CONCENTRATION (MICROGRAMS PER CUBIC METER) DUE TO SOURCE 1 **

- GRID SYSTEM RECEPTORS -

- X AXIS (DISTANCE, METERS) -

Y AXIS (DISTANCE , METERS)	-2000.000	-1800.000	-1600.000	-1400.000	-1200.000	-1000.000	-800.000	-600.000	-400.000

- CONCENTRATION -

1400.000	0.000005	0.000007	0.000009	0.000012	0.000021	0.000033	0.000049	0.000069	0.000091
1200.000	0.000004	0.000005	0.000008	0.000011	0.000015	0.000029	0.000049	0.000075	0.000109
1000.000	0.000002	0.000004	0.000006	0.000009	0.000013	0.000020	0.000044	0.000079	0.000127
800.000	0.000001	0.000002	0.000003	0.000006	0.000010	0.000017	0.000028	0.000074	0.000146
600.000	0.000002	0.000002	0.000002	0.000002	0.000005	0.000012	0.000023	0.000045	0.000152
400.000	0.000003	0.000003	0.000004	0.000004	0.000004	0.000003	0.000010	0.000032	0.000086
200.000	0.000004	0.000005	0.000006	0.000007	0.000008	0.000009	0.000011	0.000011	0.000030
0.000	0.000005	0.000006	0.000008	0.000010	0.000012	0.000017	0.000024	0.000040	0.000077
-200.000	0.000007	0.000008	0.000010	0.000013	0.000017	0.000024	0.000037	0.000063	0.000118
-400.000	0.000008	0.000009	0.000012	0.000015	0.000020	0.000028	0.000038	0.000054	0.000074
-600.000	0.000008	0.000010	0.000013	0.000016	0.000020	0.000025	0.000031	0.000039	0.000058
-800.000	0.000009	0.000011	0.000012	0.000015	0.000017	0.000021	0.000025	0.000033	0.000043
-1000.000	0.000009	0.000010	0.000011	0.000013	0.000015	0.000017	0.000022	0.000027	0.000033
-1200.000	0.000008	0.000009	0.000010	0.000011	0.000013	0.000016	0.000019	0.000023	0.000026
-1400.000	0.000007	0.000008	0.000009	0.000010	0.000012	0.000014	0.000016	0.000019	0.000021
-1600.000	0.000007	0.000007	0.000008	0.000009	0.000011	0.000013	0.000014	0.000016	0.000018
-1800.000	0.000006	0.000007	0.000008	0.000009	0.000010	0.000011	0.000012	0.000014	0.000015
-2000.000	0.000006	0.000006	0.000007	0.000008	0.000009	0.000010	0.000011	0.000012	0.000013

- GRID SYSTEM RECEPTORS -
- X AXIS (DISTANCE, METERS) -

Y AXIS (DISTANCE, METERS) - CONCENTRATION -	-200.000	0.000	200.000	400.000	600.000	800.000	1000.000	1200.000	1400.000
2000.000	0.000068	0.000076	0.000061	0.000045	0.000030	0.000016	0.000012	0.000010	0.000009
1800.000	0.000080	0.000090	0.000070	0.000049	0.000030	0.000016	0.000013	0.000011	0.000009
1600.000	0.000095	0.000110	0.000082	0.000054	0.000027	0.000018	0.000015	0.000012	0.000010
1400.000	0.000116	0.000136	0.000096	0.000057	0.000024	0.000020	0.000016	0.000012	0.000010
1200.000	0.000144	0.000175	0.000115	0.000058	0.000028	0.000022	0.000017	0.000013	0.000012
1000.000	0.000183	0.000235	0.000139	0.000049	0.000033	0.000024	0.000017	0.000016	0.000015
800.000	0.000247	0.000344	0.000169	0.000057	0.000038	0.000024	0.000023	0.000020	0.000018
600.000	0.000341	0.000556	0.000187	0.000072	0.000040	0.000035	0.000030	0.000025	0.000021
400.000	0.000449	0.001065	0.000188	0.000080	0.000065	0.000049	0.000038	0.000030	0.000024
200.000	0.000226	0.002745	0.000243	0.000158	0.000095	0.000062	0.000044	0.000033	0.000026
0.000	0.000202	0.000000	0.000455	0.000197	0.000106	0.000067	0.000046	0.000035	0.000027
-200.000	0.000193	0.000437	0.000111	0.000252	0.000160	0.000095	0.000063	0.000046	0.000035
-400.000	0.000127	0.000184	0.000084	0.000039	0.000085	0.000085	0.000072	0.000053	0.000040
-600.000	0.000081	0.000099	0.000058	0.000034	0.000020	0.000040	0.000045	0.000044	0.000041
-800.000	0.000054	0.000062	0.000043	0.000027	0.000018	0.000012	0.000023	0.000028	0.000029
-1000.000	0.000039	0.000043	0.000032	0.000021	0.000016	0.000012	0.000009	0.000015	0.000019
-1200.000	0.000030	0.000032	0.000025	0.000019	0.000014	0.000011	0.000008	0.000006	0.000011

** ANNUAL GROUND LEVEL CONCENTRATION (MICROGRAMS PER CUBIC METER) DUE TO SOURCE 1 (CONT.) **

- GRID SYSTEM RECEPTORS -
- X AXIS (DISTANCE, METERS) -

Y AXIS (DISTANCE, METERS) - CONCENTRATION -	-200.000	0.000	200.000	400.000	600.000	800.000	1000.000	1200.000	1400.000
-1400.000	0.000024	0.000025	0.000021	0.000016	0.000012	0.000010	0.000008	0.000006	0.000005
-1600.000	0.000019	0.000020	0.000017	0.000014	0.000010	0.000009	0.000007	0.000006	0.000005
-1800.000	0.000016	0.000016	0.000014	0.000012	0.000010	0.000008	0.000006	0.000006	0.000005
-2000.000	0.000013	0.000014	0.000012	0.000010	0.000009	0.000007	0.000006	0.000005	0.000004

- GRID SYSTEM RECEPTORS -
- X AXIS (DISTANCE, METERS) -

Y AXIS (DISTANCE, METERS) - CONCENTRATION -	1600.000	1800.000	2000.000

[illegible]	[illegible]	[illegible]	0.000006
1600.000	0.000008	0.000007	0.000007
1400.000	0.000009	0.0006[illegible]	0.000008
1200.000	0.000011	0.000010	0.000010
1000.000	0.000013	0.000012	0.000011
800.000	0.000016	0.000014	0.000012
600.000	0.000018	0.000016	0.000013
400.000	0.000020	0.000017	0.000014
200.000	0.000021	0.000018	0.000015
0.000	0.000022	0.000018	0.000015
-200.000	0.000027	0.000022	0.000018
-400.000	0.000031	0.000025	0.000021
-600.000	0.000034	0.000028	0.000023
-800.000	0.000028	0.000027	0.000024
-1000.000	0.000020	0.000020	0.000020
-1200.000	0.000013	0.000015	0.000015
-1400.000	0.000008	0.000010	0.000011
-1600.000	0.000004	0.000006	0.000008
-1800.000	0.000004	0.000003	0.000005
-2000.000	0.000004	0.000003	0.000003

1

********** END OF ISCLT PROGRAM, 1 SOURCES PROCESSED **********

1 ISCLT (DATED 87352)
AN AIR QUALITY DISPERSION MODEL IN
SECTION 1. GUIDELINE MODELS
IN UNAMAP (VERSION 6) JAN. 88.
BOWMAN ENVIRONMENTAL ENGINEERING VERSION 6.3.

SESSION INFORMATION

INPUT DATA FILE NAME : baecr6.dta
OUTPUT LIST FILE NAME : baecr6.LST

*** WARNING - FREQ. OF OCCURRENCE OF SPD VS. DIR IS NOT 1.0 FOR SEASON 1, PROG. DIVIDES BY 0.78773 TO NORMALIZE

- ISCLT INPUT DATA -

NUMBER OF SOURCES = 1
NUMBER OF X AXIS GRID SYSTEM POINTS = 21
NUMBER OF Y AXIS GRID SYSTEM POINTS = 21
NUMBER OF SPECIAL POINTS = 0
NUMBER OF SEASONS = 1
NUMBER OF WIND SPEED CLASSES = 6
NUMBER OF STABILITY CLASSES = 6
NUMBER OF WIND DIRECTION CLASSES = 16
FILE NUMBER OF DATA FILE USED FOR REPORTS = 1
THE PROGRAM IS RUN IN RURAL MODE
CONCENTRATION (DEPOSITION) UNITS CONVERSION FACTOR =0.10000000E+07
ACCELERATION OF GRAVITY (METERS/SEC**2) = 9.800
HEIGHT OF MEASUREMENT OF WIND SPEED (METERS) = 10.000
CORRECTION ANGLE FOR GRID SYSTEM VERSUS DIRECTION DATA NORTH (DEGREES) = 0.000
DECAY COEFFICIENT =0.00000000E+00
PROGRAM OPTION SWITCHES = 1, 1, 1, 0, 0, 3, 2, 1, 3, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 1, 1, 1, 0,
DISTANCE X AXIS GRID SYSTEM POINTS (METERS)= -1000.00, -900.00, -800.00, -700.00, -600.00, -500.00,
-400.00, -300.00, -200.00, -100.00, 0.00, 100.00, 200.00, 300.00, 400.00, 500.00,
600.00, 700.00, 800.00, 900.00, 1000.00,
DISTANCE Y AXIS GRID SYSTEM POINTS (METERS)= -1000.00, -900.00, -800.00, -700.00, -600.00, -500.00,
-400.00, -300.00, -200.00, -100.00, 0.00, 100.00, 200.00, 300.00, 400.00, 500.00,
600.00, 700.00, 800.00, 900.00, 1000.00,
0 - AMBIENT AIR TEMPERATURE (DEGREES KELVIN) -

	STABILITY CATEGORY 1	STABILITY CATEGORY 2	STABILITY CATEGORY 3	STABILITY CATEGORY 4	STABILITY CATEGORY 5	STABILITY CATEGORY 6
SEASON 1	293.0000	293.0000	293.0000	293.0000	293.0000	293.0000

0 - MIXING LAYER HEIGHT (METERS) -

SEASON 1

	WIND SPEED CATEGORY 1	WIND SPEED CATEGORY 2	WIND SPEED CATEGORY 3	WIND SPEED CATEGORY 4	WIND SPEED CATEGORY 5	WIND SPEED CATEGORY 6
STABILITY CATEGORY 1	0.500000E+04	0.500000E+04	0.500000E+04	0.500000E+04	0.500000E+04	0.500000E+04
STABILITY CATEGORY 2	0.500000E+04	0.500000E+04	0.500000E+04	0.500000E+04	0.500000E+04	0.500000E+04
STABILITY CATEGORY 3	0.225000E+04	0.225000E+04	0.225000E+04	0.225000E+04	0.225000E+04	0.225000E+04
STABILITY CATEGORY 4	0.225000E+04	0.225000E+04	0.225000E+04	0.225000E+04	0.225000E+04	0.225000E+04
STABILITY CATEGORY 5	0.100000E+05	0.100000E+05	0.100000E+05	0.100000E+05	0.100000E+05	0.100000E+05
STABILITY CATEGORY 6	0.100000E+05	0.100000E+05	0.100000E+05	0.100000E+05	0.100000E+05	0.100000E+05

- ISCLT INPUT DATA (CONT.) -

0 - FREQUENCY OF OCCURRENCE OF WIND SPEED, DIRECTION AND STABILITY -
0 SEASON 1

DIRECTION (DEGREES)	WIND SPEED CATEGORY 1 (1.5000MPS)	WIND SPEED CATEGORY 2 (2.5000MPS)	WIND SPEED CATEGORY 3 (4.3000MPS)	WIND SPEED CATEGORY 4 (6.8000MPS)	WIND SPEED CATEGORY 5 (9.5000MPS)	WIND SPEED CATEGORY 6 (12.5000MPS)
0.000	0.00050779	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
22.500	0.00005078	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
45.000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
67.500	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
90.000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
112.500	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
135.000	0.00005078	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
157.500	0.00134564	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
180.000	0.00106635	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
202.500	0.00062204	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
225.000	0.00027928	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
247.500	0.00005078	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
270.000	0.00050779	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
292.500	0.00016503	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
315.000	0.00039354	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
337.500	0.00055857	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000

0 SEASON 1

0 STABILITY CATEGORY 2

DIRECTION (DEGREES)	WIND SPEED CATEGORY 1 (1.5000MPS)	WIND SPEED CATEGORY 2 (2.5000MPS)	WIND SPEED CATEGORY 3 (4.3000MPS)	WIND SPEED CATEGORY 4 (6.8000MPS)	WIND SPEED CATEGORY 5 (9.5000MPS)	WIND SPEED CATEGORY 6 (12.5000MPS)
0.000	0.00455740	0.00201846	0.00000000	0.00000000	0.00000000	0.00000000
22.500	0.00140911	0.00062204	0.00000000	0.00000000	0.00000000	0.00000000
45.000	0.00021581	0.00050779	0.00000000	0.00000000	0.00000000	0.00000000
67.500	0.00039354	0.00073629	0.00000000	0.00000000	0.00000000	0.00000000
90.000	0.00016503	0.00062204	0.00000000	0.00000000	0.00000000	0.00000000
112.500	0.00005078	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
135.000	0.00034276	0.00129486	0.00000000	0.00000000	0.00000000	0.00000000
157.500	0.00601729	0.01068894	0.00000000	0.00000000	0.00000000	0.00000000
180.000	0.00696939	0.01647772	0.00000000	0.00000000	0.00000000	0.00000000
202.500	0.00201846	0.00698209	0.00000000	0.00000000	0.00000000	0.00000000
225.000	0.00050779	0.00112983	0.00000000	0.00000000	0.00000000	0.00000000
247.500	0.00044431	0.00050779	0.00000000	0.00000000	0.00000000	0.00000000
270.000	0.00022850	0.00106635	0.00000000	0.00000000	0.00000000	0.00000000
292.500	0.00033006	0.00152336	0.00000000	0.00000000	0.00000000	0.00000000
315.000	0.00090132	0.00118061	0.00000000	0.00000000	0.00000000	0.00000000
337.500	0.00326254	0.00147259	0.00000000	0.00000000	0.00000000	0.00000000

- ISCLT INPUT DATA (CONT.) -

0 - FREQUENCY OF OCCURRENCE OF WIND SPEED, DIRECTION AND STABILITY -

0 SEASON 1

0 STABILITY CATEGORY 3

DIRECTION (DEGREES)	WIND SPEED CATEGORY 1 (1.5000MPS)	WIND SPEED CATEGORY 2 (2.5000MPS)	WIND SPEED CATEGORY 3 (4.3000MPS)	WIND SPEED CATEGORY 4 (6.8000MPS)	WIND SPEED CATEGORY 5 (9.5000MPS)	WIND SPEED CATEGORY 6 (12.5000MPS)
0.000	0.00652508	0.00444315	0.00011425	0.00000000	0.00000000	0.00000000
22.500	0.00410039	0.00311020	0.00000000	0.00000000	0.00000000	0.00000000
45.000	0.00157414	0.00291978	0.00016503	0.00000000	0.00000000	0.00000000
67.500	0.00147259	0.00547142	0.00005078	0.00000000	0.00000000	0.00000000
90.000	0.00095210	0.00360529	0.00000000	0.00000000	0.00000000	0.00000000
112.500	0.00016503	0.00011425	0.00000000	0.00000000	0.00000000	0.00000000
135.000	0.00095210	0.00501441	0.00016503	0.00000000	0.00000000	0.00000000
157.500	0.00410039	0.02165716	0.00163762	0.00005078	0.00000000	0.00000000
180.000	0.00550950	0.03364096	0.00680436	0.00034276	0.00000000	0.00000000

270.000	0.00027928	0.00391332	0.00000000	0.00000000	0.00000000	0.00000000
292.500	0.00162492	0.00697211	0.00027928	0.00000000	0.00000000	0.00000000
315.000	0.00050779	0.00223546	0.00011425	0.00000000	0.00000000	0.00000000
337.500	0.00291978	0.00224696	0.00005078	0.00000000	0.00000000	0.00000000

0 SEASON 1

0 STABILITY CATEGORY 4

DIRECTION (DEGREES)	WIND SPEED CATEGORY 1 (1.5000MPS)	WIND SPEED CATEGORY 2 (2.5000MPS)	WIND SPEED CATEGORY 3 (4.3000MPS)	WIND SPEED CATEGORY 4 (6.8000MPS)	WIND SPEED CATEGORY 5 (9.5000MPS)	WIND SPEED CATEGORY 6 (12.5000MPS)
0.000	0.00314829	0.00321176	0.00219618	0.00005078	0.00000000	0.00000000
22.500	0.00399883	0.00196768	0.00185343	0.00011425	0.00000000	0.00000000
45.000	0.00472243	0.00421464	0.00016503	0.00000000	0.00000000	0.00000000
67.500	0.00596651	0.01023193	0.00112983	0.00000000	0.00000000	0.00000000
90.000	0.00337679	0.00432889	0.00045701	0.00000000	0.00000000	0.00000000
112.500	0.00034276	0.00016503	0.00005078	0.00000000	0.00000000	0.00000000
135.000	0.00201846	0.00776916	0.00270397	0.00011425	0.00000000	0.00000000
157.500	0.01013037	0.04170210	0.02188567	0.00355452	0.00027928	0.00000000
180.000	0.01995607	0.09145262	0.04790980	0.00500171	0.00090132	0.00000000
202.500	0.00291978	0.02936284	0.01591915	0.00286900	0.00027928	0.00000000
225.000	0.00309751	0.01788683	0.01047313	0.00151067	0.00011425	0.00000000
247.500	0.00524291	0.02612569	0.00636005	0.00039354	0.00067282	0.00000000
270.000	0.00552219	0.01105708	0.00224696	0.00005078	0.00000000	0.00000000
292.500	0.00608076	0.01626191	0.00746448	0.00044431	0.00000000	0.00000000
315.000	0.00129486	0.00371955	0.00213271	0.00016503	0.00000000	0.00000000
337.500	0.00134564	0.00236121	0.00544603	0.00062204	0.00000000	0.00000000

- ISCLT INPUT DATA (CONT.) -

0 - FREQUENCY OF OCCURRENCE OF WIND SPEED, DIRECTION AND STABILITY -

0 SEASON 1

0 STABILITY CATEGORY 5

DIRECTION (DEGREES)	WIND SPEED CATEGORY 1 (1.5000MPS)	WIND SPEED CATEGORY 2 (2.5000MPS)	WIND SPEED CATEGORY 3 (4.3000MPS)	WIND SPEED CATEGORY 4 (6.8000MPS)	WIND SPEED CATEGORY 5 (9.5000MPS)	WIND SPEED CATEGORY 6 (12.5000MPS)
0.000	0.00258972	0.00523022	0.00000000	0.00000000	0.00000000	0.00000000
22.500	0.00241199	0.00342757	0.00000000	0.00000000	0.00000000	0.00000000
45.000	0.00145989	0.00247547	0.00000000	0.00000000	0.00000000	0.00000000
67.500	0.00252625	0.00201846	0.00000000	0.00000000	0.00000000	0.00000000
90.000	0.00264050	0.00073629	0.00000000	0.00000000	0.00000000	0.00000000
112.500	0.00016503	0.00022850	0.00000000	0.00000000	0.00000000	0.00000000
135.000	0.00134564	0.00501441	0.00000000	0.00000000	0.00000000	0.00000000
157.500	0.00630927	0.01726479	0.00000000	0.00000000	0.00000000	0.00000000
180.000	0.00826425	0.03982328	0.00000000	0.00000000	0.00000000	0.00000000
202.500	0.00157414	0.00349104	0.00000000	0.00000000	0.00000000	0.00000000
225.000	0.00124408	0.00198037	0.00000000	0.00000000	0.00000000	0.00000000
247.500	0.00314829	0.00332601	0.00000000	0.00000000	0.00000000	0.00000000
270.000	0.00434159	0.00696939	0.00000000	0.00000000	0.00000000	0.00000000
292.500	0.00523022	0.01713785	0.00000000	0.00000000	0.00000000	0.00000000
315.000	0.00057126	0.00321176	0.00000000	0.00000000	0.00000000	0.00000000
337.500	0.00095210	0.00568723	0.00000000	0.00000000	0.00000000	0.00000000

0 SEASON 1

0 STABILITY CATEGORY 6

DIRECTION (DEGREES)	WIND SPEED CATEGORY 1 (1.5000MPS)	WIND SPEED CATEGORY 2 (2.5000MPS)	WIND SPEED CATEGORY 3 (4.3000MPS)	WIND SPEED CATEGORY 4 (6.8000MPS)	WIND SPEED CATEGORY 5 (9.5000MPS)	WIND SPEED CATEGORY 6 (12.5000MPS)
0.000	0.00742640	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000

90.000	0.00085054	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
112.500	0.00050779	0.0000[illegible]	0.00000000	0.00000000	0.00000000	0.0000
135.000	0.00624579	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
157.500	0.01828037	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
180.000	0.01956253	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
202.500	0.00112983	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
225.000	0.00085054	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
247.500	0.00180265	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
270.000	0.00638076	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
292.500	0.01244081	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
315.000	0.00173917	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
337.500	0.00252625	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000

- ISCLT INPUT DATA (CONT.) -

0 - VERTICAL POTENTIAL TEMPERATURE GRADIENT (DEGREES KELVIN/METER) -

	WIND SPEED CATEGORY 1	WIND SPEED CATEGORY 2	WIND SPEED CATEGORY 3	WIND SPEED CATEGORY 4	WIND SPEED CATEGORY 5	WIND SPEED CATEGORY 6
STABILITY CATEGORY 1	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00
STABILITY CATEGORY 2	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00
STABILITY CATEGORY 3	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00
STABILITY CATEGORY 4	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00
STABILITY CATEGORY 5	0.200000E-01	0.200000E-01	0.200000E-01	0.200000E-01	0.200000E-01	0.200000E-01
STABILITY CATEGORY 6	0.350000E-01	0.350000E-01	0.350000E-01	0.350000E-01	0.350000E-01	0.350000E-01

0 - WIND PROFILE POWER LAW EXPONENTS -

	WIND SPEED CATEGORY 1	WIND SPEED CATEGORY 2	WIND SPEED CATEGORY 3	WIND SPEED CATEGORY 4	WIND SPEED CATEGORY 5	WIND SPEED CATEGORY 6
STABILITY CATEGORY 1	0.700000E-01	0.700000E-01	0.700000E-01	0.700000E-01	0.700000E-01	0.700000E-01
STABILITY CATEGORY 2	0.700000E-01	0.700000E-01	0.700000E-01	0.700000E-01	0.700000E-01	0.700000E-01
STABILITY CATEGORY 3	0.100000E+00	0.100000E+00	0.100000E+00	0.100000E+00	0.100000E+00	0.100000E+00
STABILITY CATEGORY 4	0.150000E+00	0.150000E+00	0.150000E+00	0.150000E+00	0.150000E+00	0.150000E+00
STABILITY CATEGORY 5	0.350000E+00	0.350000E+00	0.350000E+00	0.350000E+00	0.350000E+00	0.350000E+00
STABILITY CATEGORY 6	0.550000E+00	0.550000E+00	0.550000E+00	0.550000E+00	0.550000E+00	0.550000E+00

- SOURCE INPUT DATA -

C A R D	T A P	SOURCE NUMBER	SOURCE TYPE	X COORDINATE (M)	Y COORDINATE (M)	EMISSION HEIGHT (M)	BASE ELEV- ATION (M)	- SOURCE DETAILS DEPENDING ON TYPE -
X		1	STACK	0.00	0.00	7.00	0.00	GAS EXIT TEMP (DEG K)= 295.00, GAS EXIT VEL. (M/SEC)= 0.01, STACK DIAMETER (M)= 0.000, HEIGHT OF ASSO. BLDG. (M)= 0.00, WIDTH OF ASSO. BLDG. (M)= 0.00, WAKE EFFECTS FLAG = 0

- SOURCE STRENGTHS (GRAMS PER SEC) -

SEASON 1	SEASON 2	SEASON 3	SEASON 4
9.30000E-09			

WARNING - DISTANCE BETWEEN SOURCE 1 AND POINT X,Y= 0.00, 0.00 IS LESS THAN PERMITTED

** ANNUAL GROUND LEVEL CONCENTRATION (MICROGRAMS PER CUBIC METER) DUE TO SOURCE 1 **

- GRID SYSTEM RECEPTORS -

- X AXIS (DISTANCE, METERS) -

Y AXIS (DISTANCE , METERS) - CONCENTRATION -	-1000.000	-900.000	-800.000	-700.000	-600.000	-500.000	-400.000	-300.000	-200.000

700.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
600.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
500.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
400.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
300.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
200.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
100.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
-100.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
-200.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
-300.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
-400.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
-500.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
-600.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
-700.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
-800.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
-900.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
-1000.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

- GRID SYSTEM RECEPTORS -
- X AXIS (DISTANCE, METERS) -

Y AXIS (DISTANCE , METERS)	-100.000	0.000	100.000	200.000	300.000	400.000	500.000	600.000	700.000
	- CONCENTRATION -								
1000.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
900.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
800.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
700.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
600.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
500.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
400.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
300.000	0.000000	0.000001	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
200.000	0.000000	0.000001	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
100.000	0.000000	0.000001	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
-100.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
-200.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
-300.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
-400.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
-500.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
-600.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

** ANNUAL GROUND LEVEL CONCENTRATION (MICROGRAMS PER CUBIC METER) DUE TO SOURCE 1 (CONT.) **

- GRID SYSTEM RECEPTORS -
- X AXIS (DISTANCE, METERS) -

Y AXIS (DISTANCE , METERS)	-100.000	0.000	100.000	200.000	300.000	400.000	500.000	600.000	700.000
	- CONCENTRATION -								
-700.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
-800.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
-900.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
-1000.000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

- GRID SYSTEM RECEPTORS -
- X AXIS (DISTANCE, METERS) -

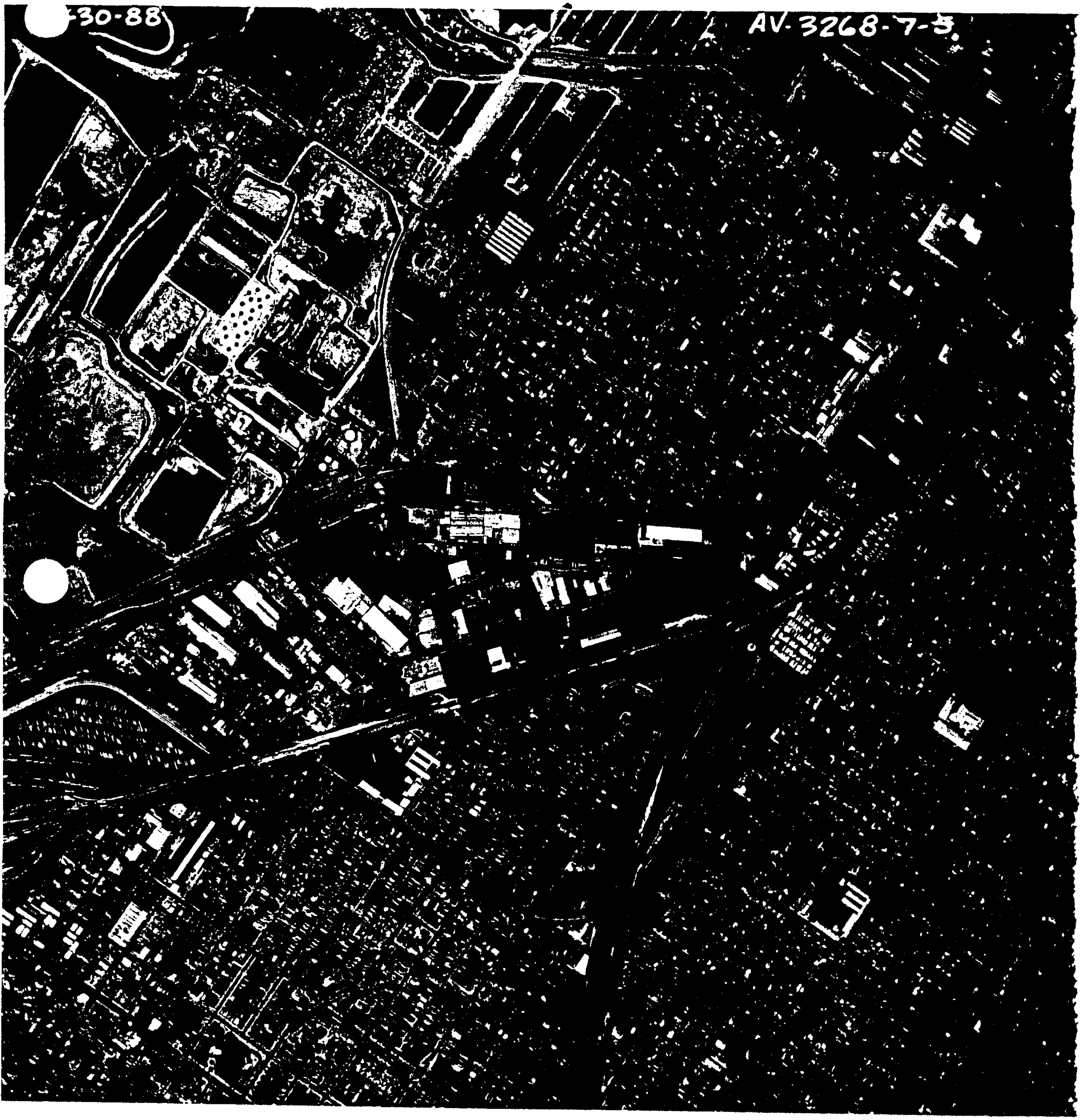
Y AXIS (DISTANCE , METERS)	800.000	900.000	1000.000
	- CONCENTRATION -		

900.000	0.000000	0.000000	0.000000
800.000	0.000000	0.000000	0.000000
700.000	0.000000	0.000000	0.000000
600.000	0.000000	0.000000	0.000000
500.000	0.000000	0.000000	0.000000
400.000	0.000000	0.000000	0.000000
300.000	0.000000	0.000000	0.000000
200.000	0.000000	0.000000	0.000000
100.000	0.000000	0.000000	0.000000
0.000	0.000000	0.000000	0.000000
-100.000	0.000000	0.000000	0.000000
-200.000	0.000000	0.000000	0.000000
-300.000	0.000000	0.000000	0.000000
-400.000	0.000000	0.000000	0.000000
-500.000	0.000000	0.000000	0.000000
-600.000	0.000000	0.000000	0.000000
-700.000	0.000000	0.000000	0.000000
-800.000	0.000000	0.000000	0.000000
-900.000	0.000000	0.000000	0.000000
-1000.000	0.000000	0.000000	0.000000

1

********** END OF ISCLT PROGRAM, 1 SOURCES PROCESSED **********

SEISMIC STANDARD AND 2000 FT. TOPOGRAPHIC RADIUS MAP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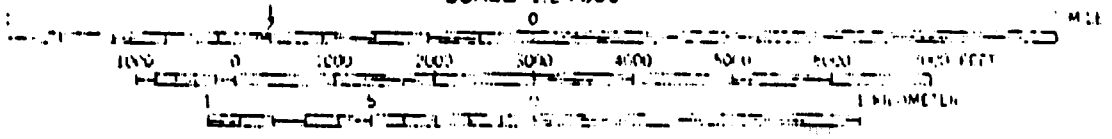


CONTOUR INTERVAL 20 FEET
DOTTED LINES REPRESENT 5 FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929
DEPTH CURVES IN FEET—DATUM IS MEAN LOWER LOW WATER
SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER
THE MEAN RANGE OF TIDE IS APPROXIMATELY 6 FEET

STATE OF CALIFORNIA
SPECIAL STUDIES ZONES

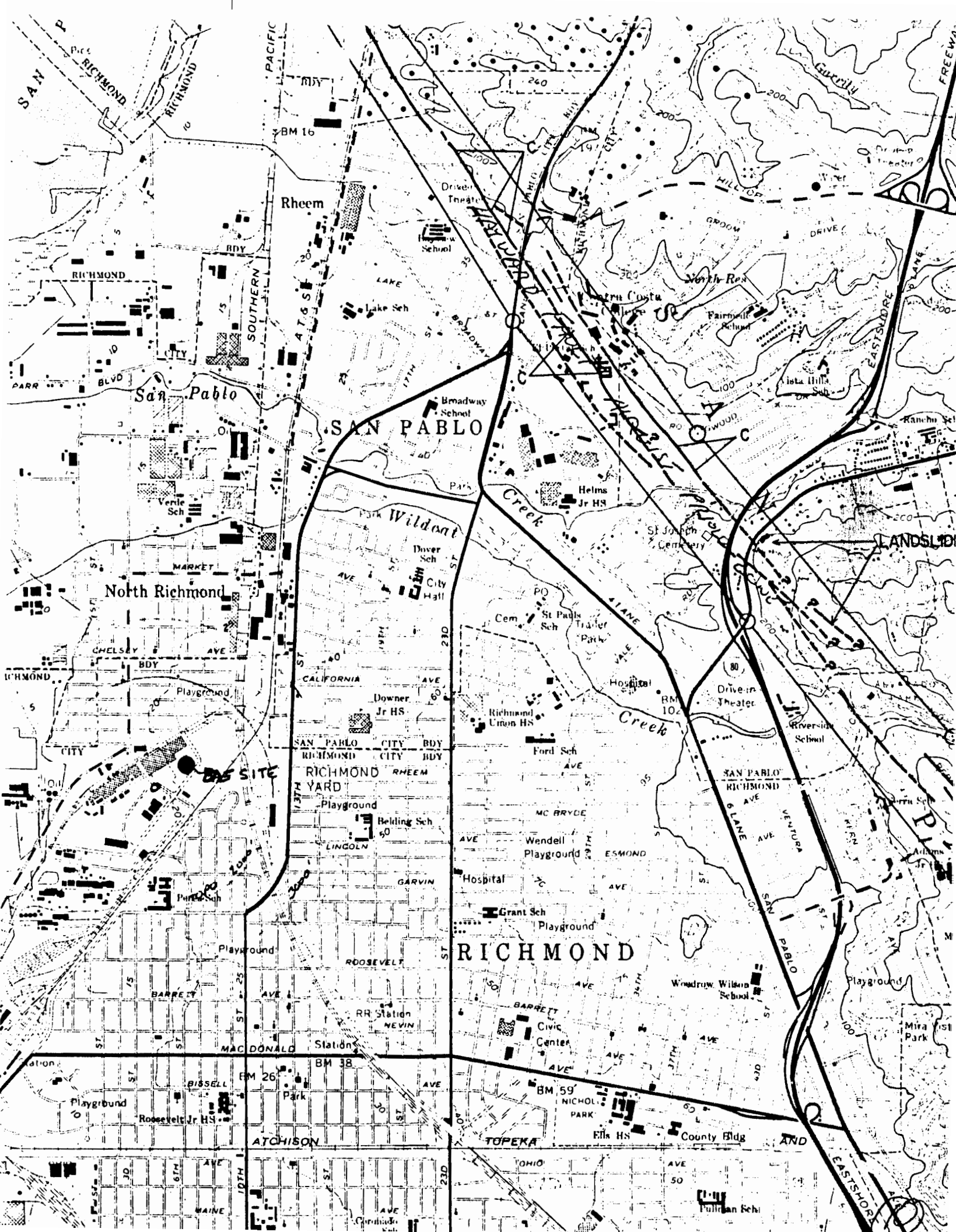
Delineated in compliance with
Chapter 7.5, Division 2 of the California Public Resources Code
(Alquist-Priolo Special Studies Zones Act)

RICHMOND

REVISED OFFICIAL MAP

Effective: January 1, 1982

James E. Davis State Geologist

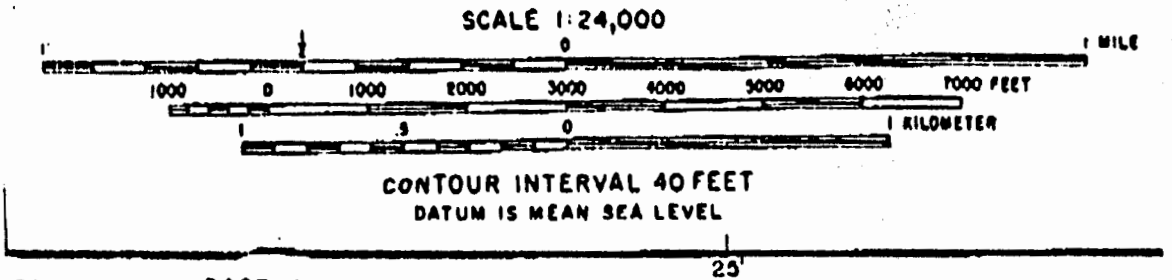

SAN PABLO
RICHMOND
North Richmond
San Pablo
Rheem
RICHMOND YARD
Wildcat Creek
Cerrito Creek
HAYWARD FAULT
LANDSLIDE
Rheem School
Lake Sch
Broadway School
Verde Sch
Dover Sch
City Hall
Downer Jr HS
Belding Sch
Playground
Peres Sch
Roosevelt Jr HS
Park
Helms Jr HS
St Joseph Cemetery
St Pauls Sch
Trailer Park
Hospital
Richmond Union HS
Ford Sch
Wendell Playground
Grant Sch
Woodrow Wilson School
Civic Center
RR Station
Station
Nichol Park
Ells HS
County Bldg
Fairmont School
Vista Hills Sch
Riverside School
Drive-in Theater
Fullman Sch
BM 16
BM 102
BM 26
BM 38
BM 59
6 LANE FREEWAY
EASTSHORE FREEWAY
SAN PABLO AVE
ATCHISON TOPEKA AND SANTA FE
SOUTHERN PACIFIC

GEOLOGIC MAP

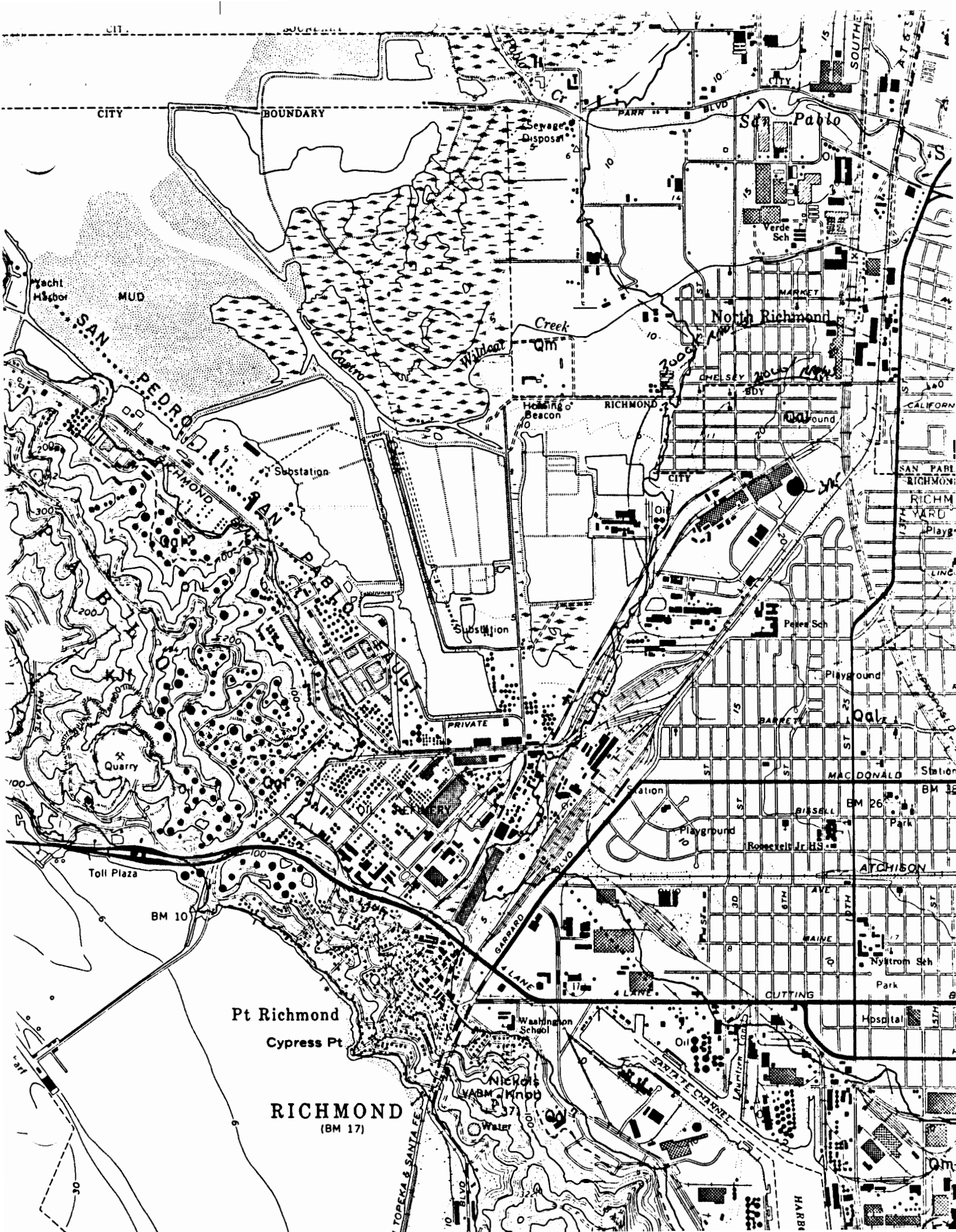
COMPILED BY R.D. KNOX
1973

a joint planning study
of the cities of
EL CERRITO
RICHMOND
SAN PABLO

tri cities
SEISMIC SAFETY and ENVIRONMENTAL RESOURCES STUDY



TOPOGRAPHIC BASE BY U.S. GEOLOGICAL SURVEY


CITY BOUNDARY
Sewage Disposal
San Pablo
Verde Sch
Yacht Harbor
MUD
SAN PEDRO
Wildcat Creek
North Richmond
Qm
Housing
Beacon
RICHMOND
Substation
SAN PABLO BAY
SAN PABLO FAULT
Substation
Peres Sch
Playground
Qal
PRIVATE
Quarry
Oil
MAC DONALD
BM 26
Park
Toll Plaza
BM 10
GARRARD BLVD
4 LANE
ATCHISON
Nystrom Sch
CUTTING
Pt Richmond
Cypress Pt
Washington School
Hospital
Nichols Knob
RICHMOND
(BM 17)
SANTA FE CHANNEL
Water
TOPEKA & SANTA FE

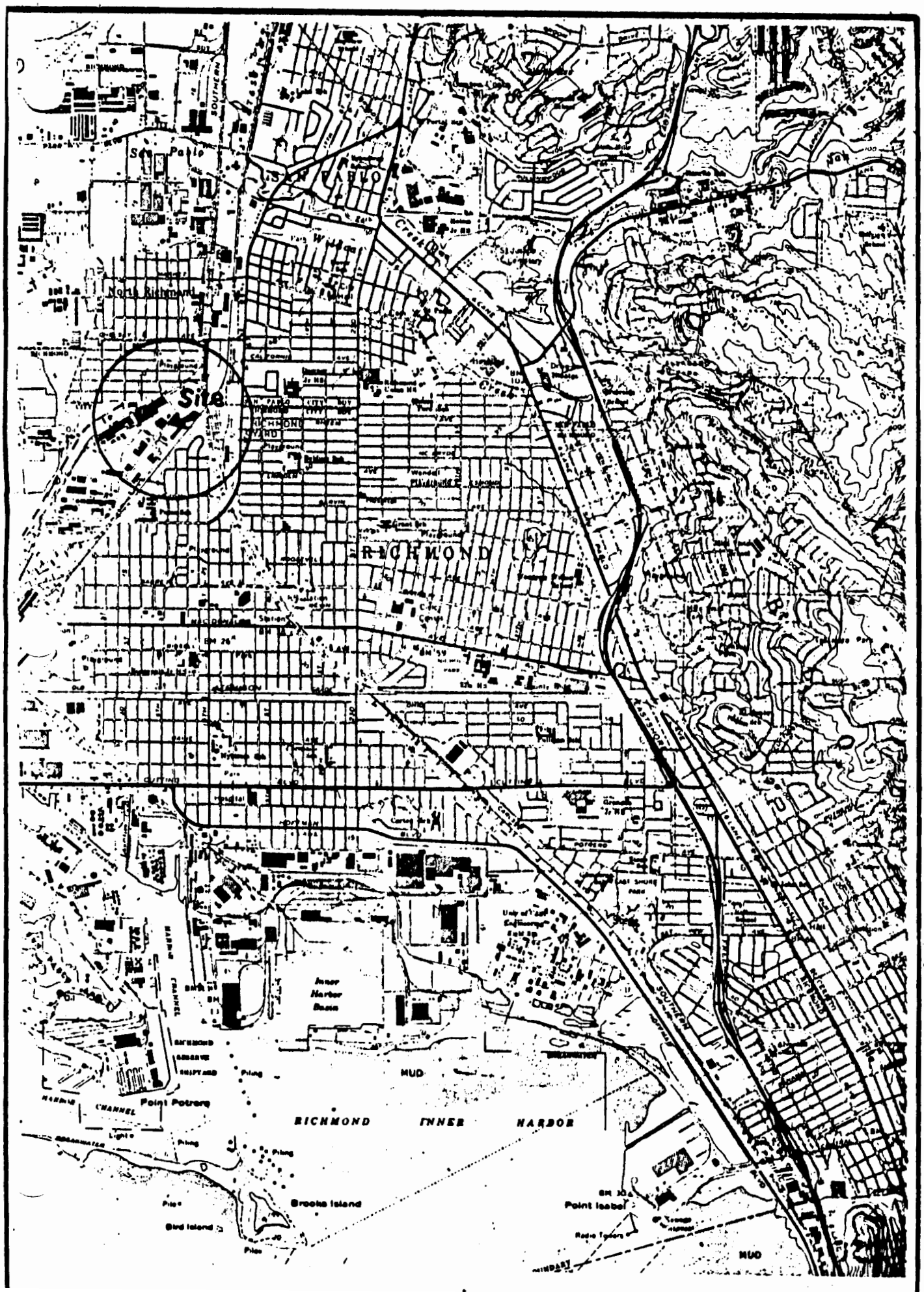

Site
RICHMOND
Inner Harbor Basin
MUD
Point Potrero
RICHMOND INNER HARBOR
Brooks Island
Bird Island
Point Isabel
MUD

TABLE 1

WELLS NEAR BAY AREA ENVIRONMENTAL, INC., RICHMOND FACILITY

Well Number	Well Owner	Location	Type	Distance (feet)	Direction From BAE Facility	Date Drilled
1	Edith Jones	511 Duboce St.	Temporarily Abandoned	1100	N	NA*
2	Lawrence Bolton	419 Stanford Ave.	Temporarily Abandoned	1000	NNW	NA
3	William Thomas	239 Vernon Ave.	Temporarily Abandoned	1400	NW	NA
4	Joseph N. Bell	1417 York St.	Temporarily Abandoned	2200	NW	NA
5	San Pablo Sanitation District	7th & Hensley	Cathodic Protechon	600	SSW	10/10/80
6	San Pablo Sanitation District	Gertrude W of Filbert	Cathodic Protechon	2000	NNW	10/2/80
7	Sacramento Municipal Utility District	818 W. Gertrude	Monitoring	1900	N	6/16/87
8	Sacramento Municipal Utility District	818 W. Gertrude	Monitoring	2300	N	6/16/87
9	Sacramento Municipal Utility District	818 W. Gertrude	Monitoring	2200	N	6/16/87

* N.A. - Not Available

APPENDIX A
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APPENDIX B

WIND SUMMARY DATA

SURFACE WIND SUMMARY

Station Name: SAN PABLO
Elevation: 250 Feet

	Degrees	Minutes
North Latitude:	37	59
West Longitude:	122	21

Period of Record:
JUL 1929 - MAR 1938
JAN 1931 - FEB 1939

Observations: 18,487

Bias Index: 0.76
Speed Units: MPH

Source Code
Data: 1
Summary: K

DIRECTION	WINTER % OF TIME	WINTER MEAN SPEED	SPRING % OF TIME	SPRING MEAN SPEED	SUMMER % OF TIME	SUMMER MEAN SPEED	FALL % OF TIME	FALL MEAN SPEED	ANNUAL % OF TIME	ANNUAL MEAN SPEED
N	3.8	6.8	1.1	9.5	0.1	14.8	2.8	8.4	1.6	7.9
NNE	1.6	6.9	0.4	5.8	0.1	3.8	0.5	10.3	0.7	7.1
NE	17.1	8.6	4.1	6.8	0.2	7.5	7.3	6.5	7.4	7.8
ENE	8.6	10.1	0.8	4.5	****	****	0.1	10.8	0.2	11.1
E	4.1	6.5	0.9	3.9	0.8	2.5	1.5	3.4	1.7	5.4
ESE	0.1	11.7	0.0	4.5	****	****	****	****	0.0	0.0
SE	3.1	7.5	1.5	6.7	0.3	0.9	0.9	4.7	1.5	7.0
SSE	0.0	7.0	0.9	0.2	0.1	10.0	0.0	13.0	0.5	0.2
S	9.1	0.4	11.0	0.4	15.6	13.4	11.3	7.1	11.9	9.7
SSW	2.1	0.0	9.9	10.4	25.7	14.6	11.9	0.3	12.1	11.9
SW	0.0	0.4	26.9	10.4	49.0	13.4	28.6	0.0	28.0	11.1
WSW	0.1	7.1	0.3	0.7	0.1	0.4	0.1	4.4	0.2	7.7
W	2.7	7.9	0.7	9.0	3.2	0.1	2.7	7.0	4.2	0.7
WNW	0.1	7.9	0.6	10.5	0.0	3.0	0.1	0.2	0.2	9.4
NW	2.4	13.0	3.1	12.2	0.1	10.5	1.9	0.3	1.9	11.4
NNW	0.0	25.0	0.0	1.0	****	****	0.0	7.0	0.0	10.0
CALM	44.2		29.7		4.6		31.0		27.9	
ALL		4.6		6.0		12.9		5.5		7.3

	WINTER	SPRING	SUMMER	FALL	ANNUAL
RESULTANT WINDS					
DIRECTION:	98	223	212	215	213
SPEED:	0.6	4.7	12.1	3.5	4.0
PER. RATIO:	0.12	0.70	0.94	0.64	0.66
PREDOMINANT WINDS (Alternate Definition)					
DIRECTION:	NE	SW	SW	SW	SW
SPEED:	0.5	10.4	13.0	0.6	11.3
PERCENTAGE:	19.3	37.1	75.6	40.6	40.3
SECONDARY PREDOMINANT WINDS (Alternate Definition)					
DIRECTION:	S	NE	SE	NE	NE
SPEED:	0.3	6.7	9.2	6.9	7.0
PERCENTAGE:	12.0	4.5	0.4	7.9	0.3

Prepared by: California Air Resources Board

D-8

SURFACE WIND SUMMARY

Station Name: ALAMEDA NAS
Elevation: 15 Feet (70)

	Degrees	Minutes
North Latitude:	37	47
West Longitude:	122	19

Period of Record:
1945 - 1960

Observations: 200,039
24 OBS/DAY

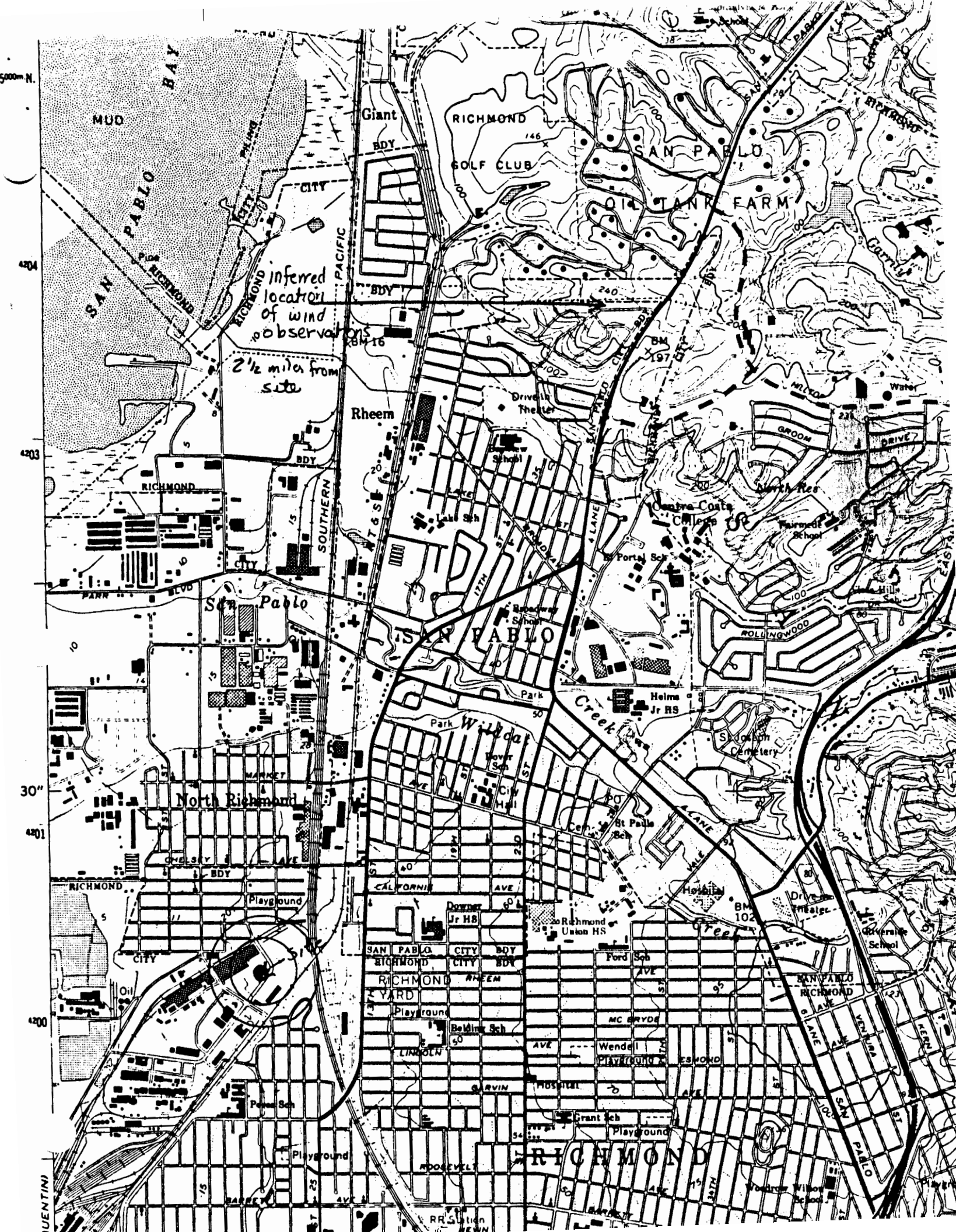
Bias Index: 0.39
Speed Units: MPH

Source Code
Data: 1
Summary: B

DIRECTION	WINTER % OF TIME	WINTER MEAN SPEED	SPRING % OF TIME	SPRING MEAN SPEED	SUMMER % OF TIME	SUMMER MEAN SPEED	FALL % OF TIME	FALL MEAN SPEED	ANNUAL % OF TIME	ANNUAL MEAN SPEED
N	9.3	7.4	3.0	0.0	1.0	5.4	5.4	7.4	4.6	7.4
NNE	1.9	6.0	0.7	6.4	0.2	4.6	1.2	6.6	1.0	6.5
NE	2.3	6.5	0.6	5.3	0.2	4.0	1.3	5.6	1.1	5.9
ENE	1.3	6.3	0.4	5.0	0.1	4.1	0.6	5.0	0.6	5.9
E	3.0	5.9	2.0	5.6	0.5	5.1	2.5	5.1	2.2	5.6
ESE	6.0	0.2	2.6	0.0	0.5	5.3	3.6	7.1	3.1	7.7
SE	10.7	10.7	4.2	11.0	0.9	6.1	5.1	9.3	5.2	10.2
SSE	4.9	10.0	2.9	10.4	0.9	6.0	2.4	9.4	2.0	10.0
S	5.9	9.1	5.3	9.7	2.7	6.4	3.9	0.2	4.4	0.7
SSW	2.3	9.0	4.1	9.0	3.5	0.1	2.5	0.3	3.1	0.9
SW	3.0	0.3	0.3	9.6	14.6	9.0	5.0	7.9	0.0	9.3
WSW	2.3	9.2	10.5	11.1	16.9	11.1	6.9	9.1	9.2	10.6
W	5.9	9.5	25.9	12.0	35.6	12.3	20.5	10.2	22.2	11.0
WNW	4.9	9.5	11.6	12.0	11.5	10.6	9.0	0.9	9.3	10.5
NW	11.3	0.0	7.4	9.6	4.6	7.1	0.0	7.1	0.0	0.0
NNW	9.1	7.9	3.7	9.2	1.5	6.2	5.3	7.4	4.0	7.9
CALM	15.0		6.7		4.7		15.1		10.3	
ALL		7.3		10.1		10.0		7.2		0.7

	WINTER	SPRING	SUMMER	FALL	ANNUAL
RESULTANT WINDS					
DIRECTION:	263	262	261	269	262
SPEED:	0.4	6.3	0.6	3.5	4.0
PER. RATIO:	0.06	0.63	0.06	0.49	0.55
PREDOMINANT WINDS					
DIRECTION:	NNW	W	WSW	WNW	W
SPEED:	7.0	12.2	11.5	9.2	11.2
PERCENTAGE:	29.7	40.0	67.1	30.3	40.7
SECONDARY PREDOMINANT WINDS					
DIRECTION:	SE	SSW	NW	SW	NNW
SPEED:	10.0	9.7	9.3	0.5	7.0
PERCENTAGE:	21.6	17.7	17.6	15.2	17.4

Prepared by: California Air Resources Board


MUD
SAN PABLO BAY
SAN PABLO
BAY
Giant
RICHMOND
GOLF CLUB
SAN PABLO
OIL TANK FARM
CITY
BDY
PACIFIC
RICHMOND
inferred location of wind observations
2½ miles from site
BM 16
BM 197
Rheem
Drive-In Theater
Water
GROOM
DRIVE
North Res
Contra Costa College
Fairmede School
St Portal Sch
Broadway School
SAN PABLO
ROLLINGWOOD
Park
Wildcat Creek
Helms Jr HS
St Joseph Cemetery
San Pablo
PANN BLVD
SOUTHERN
ATSF
ALANE
17TH ST
MARKET
North Richmond
CHELSEY AVE
Playground
CALIFORNIA AVE
Downer Jr HS
City Hall
St Paul's Sch
Hospital
Drive-In Theater
Richmond Union HS
Riverside School
SAN PABLO
RICHMOND
CITY
BDY
RHEEM
YARD
Playground
Belding Sch
LINCOLN
IRVIN
Ford Sch
AVE
MC BRYDE
Wendell Playground
ESMOND
Grant Sch
Playground
RICHMOND
ROOSEVELT
Woodrow Wilson School
BARRETT AVE
RR Station
Oil
Pepe Sch
4204
4203
4201
4200
30"

KLEINFELDER

October 19, 1988
File: 10-1913-01

Mr. Thomas Meichtry
Bay Area Environmental, Inc.
1125 Hensley Street
Richmond, CA 94801

Dear Mr. Meichtry:

This letter report summarizes the work Kleinfelder has completed in order to assist Bay Area Environmental, Inc., (BAE) in applying for renewal of its Richmond, California waste holding facility operating permit. The work summarized specifically addresses completion of regulatory criteria outlined under parts 11A-1, and 2 and parts 18A, B, C, D, E, F and I of Section 66391, Title 22 of the California Administrative Code. This entailed a demonstration of compliance with the seismic standard, parts 11A-1 and 2, and completion of a topographic map within a 2,000 foot radius of BAE's Richmond facility, part 18A, B, C, D, E, F, and I as outlined in Kleinfelder's proposal 10-YP82-35, October 6, 1988.

This report includes a discussion and a list of references used in completing the appropriate parts of Section 66391, Title 22. We have also included a topographic map, Plate 1, which includes the necessary elements listed for part 18A, B, C, D, E, F, and I, Section 66391, Title 22. We have formatted this report so that you can insert the appropriate sections into your permit application.

PART 11A-1,2 DEMONSTRATION OF COMPLIANCE WITH THE SEISMIC STANDARD

11A-1 IDENTIFICATION OF GEOLOGIC FAULTS OR LINEATIONS WHICH SUGGEST THE PRESENCE OF A FAULT, WITHIN A 3,000 FOOT RADIUS OF BAE'S RICHMOND FACILITY, WHICH HAS HAD DISPLACEMENT DURING HOLOCENE TIME:

Extensive review of aerial photos, published and unpublished geologic reports do not indicate evidence of geologic faulting within a 3,000 foot radius of BAE's Richmond Facility during Holocene time. Absence of fault zones within BAE's 3,000-foot radius study zone was further verified in discussions with California Division of Mines and Geology (CDMG) geologists and the Contra Costa County geologist. The only faults noted in our literature and map review are the Hayward Fault, located approximately 9100-feet northeast of the BAE facility (Alquist-Priolo Zone) and the San Pedro/San Pablo fault located approximately 7500-feet southwest of the BAE facility. Both faults trend northwest to north northwest. Only the Hayward fault is considered active at this time and has been zoned as such by the U.S. Geological Survey (U.S.G.S) in various publications and by the CDMG in response to the Alquist-Priolo Special Studies Zone Act. The San Pedro/San Pablo fault is considered pre-Holocene. When noted on various CDMG publications, its location is concealed by alluvial material and its location is inferred. The only visible trace of the San Pedro/San Pablo fault noted on geologic maps is approximately 15,000-feet west northwest of the BAE Facility in Point San Pablo.

During our photo review of the study area, there were no physiographic, topographic or cultural features noted that would indicate active displacement. It is important to note that much of the land in the study area is covered by industrial and urban development. In addition, alluvial material in the study area has been mapped by CDMG to be roughly 50 to 200 feet thick. Consequently, it is difficult to identify fault traces in the 3,000-foot radius study area in any way other than identifying displacement of man made structures. A reconnaissance of the facility area conducted by Kleinfelder on October 10, 1988 did not note any displacement features in man made structures which could be reasonably attributed to recent fault movement.

A list of references and aerial photos reviewed for this seismic evaluation are included in Appendix A.

11A-2 - DETAILED IDENTIFICATION OF HOLOCENE DISPLACEMENT:
With respect to part 11A-1, there was no evidence of geologic faulting within 3,000 feet of BAE's Richmond facility. A site reconnaissance on October 10, 1988 indicates there was no displacement features in man made structures within 200-feet of facility operations which could be reasonably attributed to recent fault movement.

PART 18 TOPOGRAPHIC MAP WITHIN A 2,000-FOOT RADIUS OF BAY AREA ENVIRONMENTAL, INC., RICHMOND FACILITY

18A MAP SCALE AND DATE: See Plate 1

18B - 100 YEAR FLOODPLAIN AREA:

The Bay Area Environmental Site is located in "Zone C - area of minimal flooding," as designated by the United States Department of Housing and Urban Development Flood Insurance Rate Map. The 2,000-foot radius study area is considered outside of the 100-year floodplain.

18C IDENTIFICATION OF SURFACE WATERS:

Wildcat Creek and San Pablo Creek, located 4,000 and 6,500 feet respectively, north of BAE's Richmond facility were the only surface water features identified during this study. Since both creeks lie outside of the 2,000-foot radius study area, they are not noted on the topographic map (Plate 1).

18D SURROUNDING LAND USES:

Land use information for the area surrounding the Bay Area Environmental site was obtained from zoning and land use maps and accompanying documents provided by the City of Richmond. This land use information is included on the topographic map, Plate 1. Bay Area Environmental is located in an area zoned for heavy industry and designed a special industrial area under the land use plan. This industrial area is bounded approximately by the Atcheson, Topeka and Santa Fe Railroad to the south and east, and by the Southern Pacific Railroad and Vernon Avenue to the north and west. Special industrial areas are defined (in part) under the General Plan as "areas where development

is carefully controlled to ensure compatibility between the industrial operation and the other activities and character of the district, community and environment in which they are located."

Residential areas both single and multi family, lie to the northwest and southeast of the site, beyond the limits of the industrialized area. Within these residential areas are several recreational areas northeast and southeast of the site. Neighborhood and general commercial areas are present along Third Street north of the site and Thirteenth Street to the east. A portion of the Perez School lies within 2000-feet of the site to the south.

18E PREVAILING WINDS:

Summaries of surface wind data prepared by the California Air Resources Board were obtained from the National Weather Service for locations near the Bay Area Environmental Site. The station selected, San Pablo, was located approximately 2 1/2 miles north-northeast of the subject site. The station is also located on a hilltop with an elevation approximately 240-feet above mean sea level. The only period of record available from the San Pablo Station was January 1929 - March 1930 and January 1931 - February 1939. The information available from this site, indicates annual average prevailing winds from the northeast at an average velocity of 7.8 miles per hour and from the south-southwest at an average velocity of 11.0 miles per hour (weighted average of winds from S, SSW, SW). Calm winds are experienced 27.9 percent of the time (Plate 1). Tabulated information is included in the Appendix B.

More recent observations from the Alameda Naval Air Station (N.A.S.) approximately ten miles to the south were judged non-representative of wind conditions at the subject site for the following reasons: 1) Alameda N.A.S. is south of the Golden Gate, the subject site is north of the Golden Gate; and 2) Alameda NAS is located on a large flat-lying area along the San Francisco Bay, the Bay Area Environmental Site has several ridges nearby. These differences would be expected to alter local wind patterns.

18F ORIENTATION OF THE MAP: See Plate 1

18I INJECTION AND EXTRACTION WELLS:

A well canvass was conducted by inspecting records available from the Contra Costa County Environmental Health Division (EHD) in Richmond and Martinez, and the State of California Department of Water Resources (DWR) in Sacramento. The only information available for inspection from EHD was a list of wells cross-connected to the water distribution system of the East Bay Municipal Water District (EBMUD). Four temporarily abandoned wells were identified within or just beyond 2000-feet of the site. Two cathodic protection wells and three monitoring wells were identified from records of DWR for the period 1951 to 1988.

As is typical throughout the State of California, wells have often been constructed and/or abandoned without the required permits, hence it is possible that unregistered or otherwise unknown wells may exist within the study area that were not identified during the canvass. No information beyond the well locations was available. Locations of these wells are presented in Table 1. Approximate locations are shown on Plate 1. Numbers adjacent to well locations correspond to well numbers listed on Table 1.

LIMITATIONS

This report was prepared in general accordance with the accepted standard of practice which exists in Northern California at the time the investigation was performed. It should be recognized that definition and evaluation of environmental conditions is a difficult and inexact art. Judgments leading to conclusions and recommendations are generally made with an incomplete knowledge of the conditions present. More extensive studies, including additional environmental investigations, can tend to reduce the inherent uncertainties associated with such studies. If the client wishes to reduce the uncertainty beyond the level associated with this study, Kleinfelder should be notified for additional consultation.

Our firm has prepared this report for the client's exclusive use for this particular project and in accordance with generally accepted engineering practices within the area at the time of our investigation. No other warranties, expressed or implied, as to the professional advice provided are made.

If you have any questions regarding this report, please contact us immediately. We have enjoyed working on this project and look forward to working on future projects with you.

Sincerely,

KLEINFELDER, INC.

George Muehleck
Project Hydrogeologist

Cyril McRae, R.G., C.E.G. / R.G. # 3143
President

GM:CMR:me

MEMO

TO: Tom Meichtry, CEO

FROM: Muhammad A. Sharaf mas

DATE: January 25, 1989

RE: BAE MONITORING WELLS

Ground water and soil samples were obtained from BAE's monitoring wells on 12-16-88 and 12-19-88. The soil samples were taken from the following depths:

Well No.1 : 2', 4', 9.5', 14.5' and 19.5'
Well No.2 : 2.5', 4.5' and 9.5'
Well No.3 : 1.5', 5', 10' and 15'

The water samples were analyzed for halogenated organics and CAM 17 metals (acid digestion for total metal content). The top soil samples were analyzed for halogenated organics. CAM 17 metals were also determined in all soil samples. The halogenated organics (EPA 8010) were profiled by Trace Analysis Laboratory, Inc. (Hayward, CA.). CAM 17 metals were determined by Precision Analytical Laboratory, Inc. (Richmond, CA.). EPA method 8010 was used to determine the following priority pollutants:

Benzyl Chloride	1,2 - Dichlorobenzene
Bis(2-chloroethoxy)methane	1,3 - Dichlorobenzene
Bis(2-chloroisopropyl)ether	1,4 - Dichlorobenzene
Bromobenzene	Dichlorodifluoromethane
Bromodichloromethane	1,1 - Dichloroethane
Bromoform	1,2 - Dichloroethane
Bromomethane	1,1 - Dichloroethylene
Carbon tetrachloride	t-1,2 - Dichloroethylene
Chloroacetaldehyde	Dichloromethane
Chloral	1,2 - Dichloropropane
Chlorobenzene	1,3 - Dichloropropylene
Chloroethane	1,1,2,2 - Tetrachloroethane
Chloroform	1,1,1,2 - Tetrachloroethane
Chlorohexane	Tetrachloroethylene
2 - Chloroethyl vinyl ether	1,1,1 - Trichloroethane
Chloromethane	1,1,2 - Trichloroethane
Chloromethyl methyl ether	Trichloroethylene
Chlorotuluene	Trichlorofleuoromethane
Dibromochloromethane	Trichloropropane
Dibromomethane	Vinylchloride

(continued)

The top soil samples show no detectable amounts (detection limit is 0.5 ppb) of the above halogenated organic compounds. Similarly, the water samples show no detectable amounts (detection limit is 0.1 ppb) of the compounds listed, with the exception of well number 3 where trichlorethylene (detection limit is 0.3 ppb) is found at a concentration of 0.7 ppb.

Water samples from wells number 2 and 3 show no detectable amounts of CAM 17 metals. Well number 1 shows only barium at a concentration of 0.1 ppm (detection limit is 0.05 ppm). The following CAM 17 profiles are reported for the soil samples:

Monitoring Well Number 1
(CAM 17 metals in ppm, ND=Not Detected)

	2'	4'	9.5'	14.5'	19.5'
Tl	ND	ND	ND	ND	ND
As	ND	ND	ND	ND	ND
Hg	ND	ND	ND	ND	ND
Se	ND	ND	ND	ND	ND
Mo	ND	ND	ND	ND	ND
Sb	ND	1.5	ND	2.3	1.6
Zn	86	42	22	26	27
Cd	2.8	4.2	2.9	3.4	4.0
Pb	24	19	13	17	20
Co	7.0	8.7	4.8	6.0	8.6
Ni	28	46	44	28	29
Cr	18	7.6	32	23	27
V	14	15	16	11	10
Be	ND	ND	0.3	ND	ND
Cu	77	19	13	12	10
Ag	ND	ND	ND	ND	ND
Ba	89	100	67	78	92

(continued)

Monitoring Well Number 2
(CAM 17 metals in ppm, ND=Not Detected)

	2.5'	4.5'	9.5'
Tl	ND	ND	ND
As	ND	ND	ND
Hg	ND	ND	ND
Se	ND	ND	ND
Mo	ND	ND	ND
Sb	1.7	ND	1.7
Zn	110	37	32
Cd	2.9	3.0	3.1
Pb	40	25	14
Co	8.4	8.0	8.2
Ni	33	35	48
Cr	19	20	25
V	15	14	20
Be	ND	ND	ND
Cu	37	21	15
Ag	ND	ND	ND
Ba	83	81	98

(continued)

Monitoring Well Number 3
(CAM 17 Metals in ppm, ND=Not Detected)

	1.5'	5'	10'	15'
Tl	ND	ND	ND	ND
As	ND	ND	ND	ND
Hg	ND	ND	ND	ND
Se	14	ND	ND	ND
Mo	ND	ND	ND	ND
Sb	2.4	1.9	1.1	ND
Zn	250	14	22	32
Cd	4.4	2.8	2.2	3.1
Pb	97	13	13	14
Co	12	9.3	7.3	6.1
Ni	47	14	40	3.2
Cr	27	19	28	32
V	22	17	7.5	11
Be	ND	ND	0.3	ND
Cu	61	7.8	11	12
Ag	ND	ND	ND	ND
Ba	120	71	100	100

The above profiles indicate that the surface soil is generally richer in Cu, Pb and Zn than the deep soil. There also appears to be significant horizontal variations for both lead and zinc near the surface.

MAS/tdt

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545 (415) 783-6960

TAL

FAX - (415) 783-1512

DATE: 1/19/89

FROM: Dariush

TO: Muhammad Shaaf

FAX NUMBER: 235-9427

NUMBER OF PAGES (Including This Page): 5

Trace Analysis Laboratory, Inc.
3433 Investment Boulevard, #8 • Hayward, California 94545 (415) 783-6960

TAL

DATE: 1/11/89

LOG NO.: 6846

DATE RECEIVED: 12/28/88

CUSTOMER: Bay Area Environmental, Inc.

REQUESTER: Muhammad Sharaf

Sample Type: Soil

Method and Constituent	Units	B-1-2 Concentration	B-1-2 Detection Limit	B-2-2.5 Concentration	B-2-2.5 Detection Limit	B-3-1.5 Concentration	B-3-1.5 Detection Limit
EPA Method 8010:							
Benzyl chloride	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
Bis (2-chloroethoxy) methane	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
Bis (2-chloroisopropyl) ether	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
Bromobenzene	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
Bromodichloromethane	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
Bromoform	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
Bromomethane	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
Carbon tetrachloride	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
Chloracetaldehyde	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
Chloral	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
Chlorobenzene	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
Chloroethane	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
Chloroform	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
1-Chlorohexane	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
2-Chloroethyl vinyl ether	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
Chloromethane	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
Chloromethyl methyl ether	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
Chlorotoluene	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
Dibromochloromethane	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5

DATE: 1/11/89
LOG NO.: 6846
DATE RECEIVED: 12/28/88
PAGE: Two

Sample Type: Soil

Method and Constituent	Units	B-1-2 Concentration	B-1-2 Detection Limit	B-2-2.5 Concentration	B-2-2.5 Detection Limit	B-3-1.5 Concentration	B-3-1.5 Detection Limit
EPA Method 8010 (Continued):							
Dibromomethane	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
1,2-Dichlorobenzene	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
1,3-Dichlorobenzene	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
1,4-Dichlorobenzene	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
Dichlorodifluoromethane	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
1,1-Dichloroethane	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
1,2-Dichloroethane	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
1,1-Dichloroethylene	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
trans-1,2-Dichloroethylene	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
Dichloromethane	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
1,2-Dichloropropane	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
1,3-Dichloropropylene	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
1,1,2,2-Tetrachloroethane	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
1,1,1,2-Tetrachloroethane	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
Tetrachloroethylene	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
1,1,1-Trichloroethane	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
1,1,2-Trichloroethane	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
Trichloroethylene	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
Trichlorofluoromethane	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
Trichloropropane	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
Vinyl chloride	ug/kg	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5

DATE: 1, /89
LOG NO.: 6846
DATE RECEIVED: 12/28/88
PAGE: Three

Sample Type: Water

Method and Constituent	Units	MW-1 Concentration	MW-1 Detection Limit	MW-2 Concentration	MW-2 Detection Limit	MW-3 Concentration	MW-3 Detection Limit
EPA Method 8010:							
Benzyl chloride	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
Bis (2-chloroethoxy) methane	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
Bis (2-chloroisopropyl) ether	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
Bromobenzene	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
Bromodichloromethane	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
Bromoform	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
Bromomethane	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
Carbon tetrachloride	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
Chloracetaldehyde	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
Chloral	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
Chlorobenzene	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
Chloroethane	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
Chloroform	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
1-Chlorohexane	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
2-Chloroethyl vinyl ether	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
Chloromethane	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
Chloromethyl methyl ether	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
Chlorotoluene	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
Dibromochloromethane	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
Dibromomethane	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
1,2-Dichlorobenzene	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
1,3-Dichlorobenzene	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
1,4-Dichlorobenzene	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
Dichlorodifluoromethane	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
1,1-Dichloroethane	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
1,2-Dichloroethane	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
1,1-Dichloroethylene	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1

DATE: 1/11/89
LOG NO.: 684
DATE RECEIVED: 12/28/88
PAGE: Four

Sample Type: Water

Method and Constituent	Units	MW-1 Concentration	MW-1 Detection Limit	MW-2 Concentration	MW-2 Detection Limit	MW-3 Concentration	MW-3 Detection Limit
EPA Method 8010 (Continued):							
trans-1,2-Dichloroethylene	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
Dichloromethane	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
1,2-Dichloropropane	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
1,3-Dichloropropylene	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
1,1,2,2-Tetrachloroethane	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
1,1,1,2-Tetrachloroethane	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
Tetrachloroethylene	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
1,1,1-Trichloroethane	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
1,1,2-Trichloroethane	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
Trichloroethylene	ug/l	< 0.1	0.1	< 0.1	0.1	0.7	0.3
Trichlorofluoromethane	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
Trichloropropane	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1
Vinyl chloride	ug/l	< 0.1	0.1	< 0.1	0.1	< 0.1	0.1

Hugh R. McLean

Hugh R. McLean
Supervisory Chemist

HRM:mln

Precision Analytical Laboratory, Inc.
4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-0300 FAX (415) 222-1251

CERTIFICATE OF ANALYSIS

State License No. 211

Date Received: 09/30/88
Date Reported: 10/13/88
Job #: 70609

Bay Area Environmental
1125 Hensley Street
Richmond, CA. 94806

Analysis Method EPA 6010
Prep Method EPA 3050
mg/kg

Lab ID:	70609-1	70609-2	70609-3	70609-4	
Client #:	BAE-B1-1	BAE-B1-4	BAE-B1-9-5	BAE-B1-14-5	MDL
Tl	ND<1.0	ND<1.0	ND<1.0	ND<1.0	1.0
As	ND<10	ND<10	ND<10	ND<10	10
Hg	ND<5.0	ND<5.0	ND<5.0	ND<5.0	5.0
Se	ND<10	ND<10	ND<10	ND<10	10
Mo	ND<1.0	ND<1.0	ND<1.0	ND<1.0	1.0
Sb	ND<1.0	1.5	ND<1.0	2.3	1.0
Zn	86	42	22	26	0.15
Cd	2.8	4.2	2.9	3.4	0.3
Pb	24	19	13	17	1.1
Co	7.0	8.7	4.8	6.0	0.5
Ni	28	46	44	28	0.65
Cr	18	7.6	32	23	0.15
V	14	15	16	11	0.1
Be	ND<0.05	ND<0.05	0.3	ND<0.05	0.05
Cu	77	19	13	12	0.1
Ag	ND<0.1	ND<0.1	ND<0.1	ND<0.1	0.1
Ba	89	100	67	78	0.1

MDL: Method Detection Limit; Compound below this level would not be detected

Jaime Chow
Laboratory Director

Precision Analytical Laboratory, Inc.
4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-0300 FAX (415) 222-1251

Bay Area Environmental
Job No: 70609

Lab ID:	70609-5	70609-6	70609-7	70609-8	
Client #:	BAE-B1-19-5	BAE-B2-2-5	BAE-B2-4-5	BAE-B2-9-5	MDL
Tl	ND<1.0	ND<1.0	ND<1.0	ND<1.0	1.0
As	ND<10	ND<10	ND<10	ND<10	10
Hg	ND<5.0	ND<5.0	ND<5.0	ND<5.0	5.0
Se	ND<10	ND<10	ND<10	ND<10	10
Mo	ND<1.0	ND<1.0	ND<1.0	ND<1.0	1.0
Sb	1.6	1.7	ND<1.0	1.7	1.0
Zn	27	110	37	32	0.15
Cd	4.0	2.9	3.0	3.1	0.3
Pb	20	40	25	14	1.1
Co	8.6	8.4	8.0	8.2	0.5
Ni	29	33	35	48	0.65
Cr	27	19	20	25	0.15
V	10	15	14	20	0.1
Be	ND<0.05	ND<0.05	ND<0.05	ND<0.05	0.05
Cu	10	37	21	15	0.1
Ag	ND<0.1	ND<0.1	ND<0.1	ND<0.1	0.1
Ba	92	83	81	98	0.1

Lab ID:	70609-9	70609-10	70609-11	70609-12	
Client #:	BAE-B3-1-5	BAE-B3-5	BAE-B3-10	BAE-B3-15	MDL
Tl	ND<1.0	ND<1.0	ND<1.0	ND<1.0	1.0
As	ND<10	ND<10	ND<10	ND<10	10
Hg	ND<5.0	ND<5.0	ND<5.0	ND<5.0	5.0
Se	14	ND<10	ND<10	ND<10	10
Mo	ND<1.0	ND<1.0	ND<1.0	ND<1.0	1.0
Sb	2.4	1.9	1.1	ND<1.0	1.0
Zn	250	14	22	32	0.15
Cd	4.4	2.8	2.2	3.1	0.3
Pb	97	13	13	14	1.1
Co	12	9.3	7.3	6.1	0.5
Ni	47	14	40	32	0.65
Cr	27	19	28	32	0.15
V	22	17	7.5	11	0.1
Be	ND<0.05	ND<0.05	0.3	ND<0.05	0.05
Cu	61	7.8	11	12	0.1
Ag	ND<0.1	ND<0.1	ND<0.1	ND<0.1	0.1
Ba	120	71	100	100	0.1

Precision Analytical Laboratory, Inc.
4136 LAKESIDE DRIVE, RICHMOND, CA 94806 PHONE (415) 222-0300 FAX (415) 222-1251

Bay Area Environmental
Job No: 70609

Analysis Method EPA 6010
Prep Method EPA 3010
mg/l

Lab ID:	70609-13	70609-14	70609-15		% Spike
Client #:	BAE-MW-1	BAE-MW-2	BAE-MW-3	MDL	Recovery
Tl	ND<0.08	ND<0.08	ND<0.08	0.08	85
As	ND<0.5	ND<0.5	ND<0.5	0.05	84
Hg	ND<0.5	ND<0.5	ND<0.5	0.05	102
Se	ND<0.5	ND<0.5	ND<0.5	0.05	78
Mo	ND<0.04	ND<0.04	ND<0.04	0.04	102
Sb	ND<0.04	ND<0.04	ND<0.04	0.04	102
Zn	ND<0.03	ND<0.03	ND<0.03	0.03	68
Cd	ND<0.012	ND<0.012	ND<0.012	0.012	88
Pb	ND<0.044	ND<0.044	ND<0.044	0.044	84
Co	ND<0.02	ND<0.02	ND<0.02	0.02	98
Ni	ND<0.05	ND<0.05	ND<0.05	0.05	86
Cr	ND<0.05	ND<0.05	ND<0.05	0.05	90
V	ND<0.05	ND<0.05	ND<0.05	0.05	102
Be	ND<0.005	ND<0.005	ND<0.005	0.005	94
Cu	ND<0.05	ND<0.05	ND<0.05	0.05	82
Ag	ND<0.05	ND<0.05	ND<0.05	0.05	92
Ba	0.1	ND<0.05	ND<0.05	0.05	102

CAMEO AIR MODEL

Chemical Data Management Systems, Inc
PO Box 1245
Pleasanton, Ca 94566
(415) 462-4642

December 27, 1988

Thomas M. Meichtry
Bay Area Environmental, Inc.
1125 Hensley Street
Richmond, Ca 94801

Dear Mr. Meichtry,

Enclosed is a brief description of the CAMEO Air Model, ALOHA (Areal Locations of Hazardous Atmospheres). I have also enclosed results of the models that were run to provide insight into the size and duration of affected areas.

Per you instructions I am also sending a copy of the enclosed material to John Davis of EIP Associates.

Best regards,

Tim Lundell

TIM LUNDELL
(415) 462-4642

CHEMICAL DATA MANAGEMENT SYSTEMS
P.O. BOX 1245
PLEASANTON, CA 94566

DECEMBER 27, 1988

BAE AIR MODEL RESULTS

Attached are CAMEO II air model outputs based on inputs supplied by BAE.

CAMEO is a trademark of the US Government and is a program developed by the National Oceanic and Atmospheric Administration (NOAA) in collaboration with the Environmental Protection Agency (EPA) to help emergency planners and first responders prepare for and more effectively deal with chemical accidents. The air model portion of the model was developed by the NOAA Hawaiian branch and is called ALOHA (Areal Locations of Hazardous Atomspheres). The system uses a dispersion model based on the US EPA's "Workbook of Atmospheric Dispersion Estimates". The chemical data used in the model is provided by NOAA.

The advantage of computer modeling is that results can be quickly and graphically obtained. The user must always keep in mind that the results are based on input approximations and estimates and can not possibly precisely define actual conditions.

In the case of BAE, the air model has been used to develop insights into the size and duration of the plumes created by accidental atmospheric releases of hazardous materials. The hazardous materials used in the model were selected from the materials contained in F001 and F002 waste as defined by the US 40 CFR Part 261 Appendix VII and whose characteristics were predefined in the NOAA database.

The releases described by the attached plumes have not actually occurred but have been created by using a potential spill scenario with estimates of size, duration and type of release, wind velocity, temperature, atmospheric stirring, low level inversions, sun positioning and surface roughness. With those factors in mind the plume definitions can be used to calculate concentration zones. The solid line plumes define regions that contain concentrations greater then the TLV-TWA (threshold limit value time weighted average). These zones should be evacuated during an emergency release. The dashed lines show the probable movement of the plume based on wind roughness. It would be prudent to evacuate up to the dashed lines. Beyond the dashed lines concentrations would be below the TLV-TWA.

When interpreting the results the user must also keep in mind that the gaussian modeling technique used in CAMEO also has some inherent limitations. NOAA has provided 5 rules for interpreting the results:

1. The nominal accuracy of the air model is a factor of two. This means that if the predicted concentration is 50 parts per million (ppm) at some distance from the source, then a measurement at that point has a high probability of being within the range of 25 to 100 ppm. This assumes that you entered the correct wind speed, stability class, and source strength into the model.

2. Model results will probably be less accurate within the first 100 yards of the spill. This is due to near-field meanders and patchiness in the pre-Gaussian region of the plume.

3. Model results will probably be less accurate beyond a mile from the spill. This is because of the possibility of far-field variations or wind shifts.

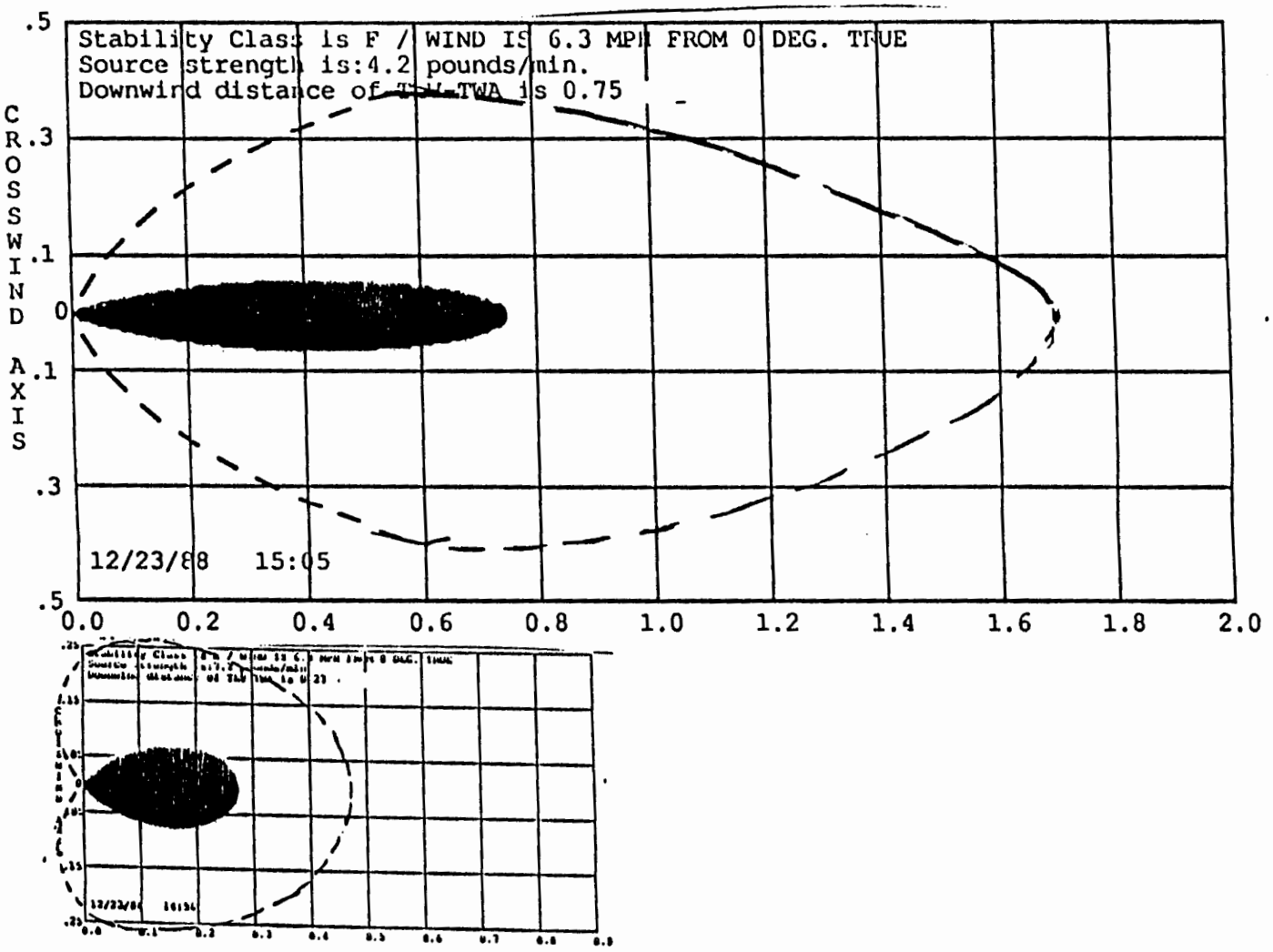
4. Model results will not represent the effects of building wakes, street canyons, or complex terrain. These small- to medium-scale variations in plume shape are not included in the model output.

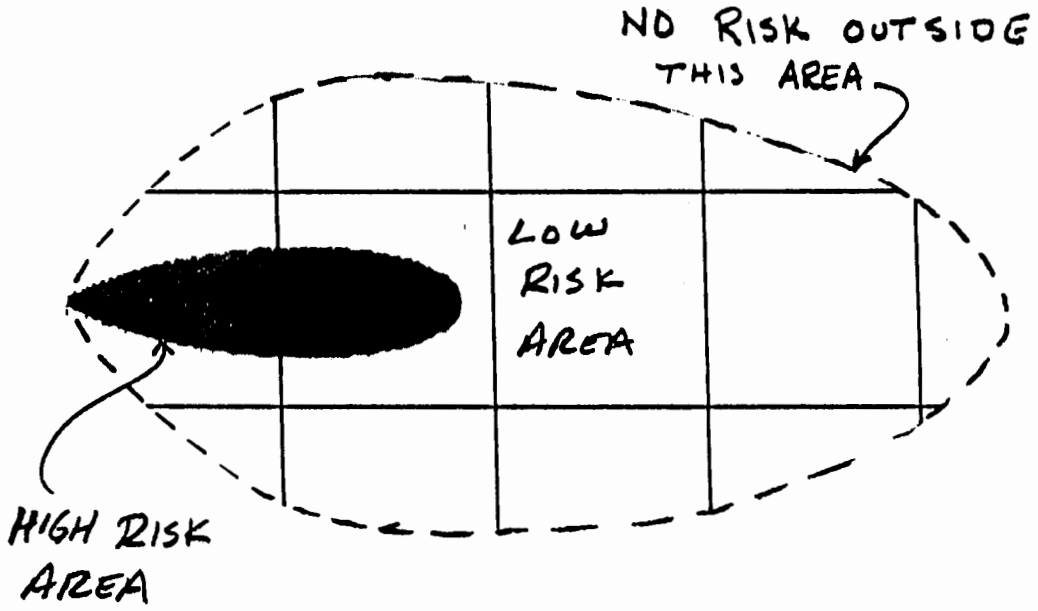
5. The model results may be less accurate under very stable conditions or at very low wind speeds. This is a general limitation of all Gaussian plume models. As the wind speed decreases to zero, the equations the model uses to calculate the size and shape of the plume become inaccurate, so unreliable results are possible. Also, the actual description of very stable conditions in terms of standard classes (A to F) is not always accurate; mixing estimates using these formulations are less reliable.

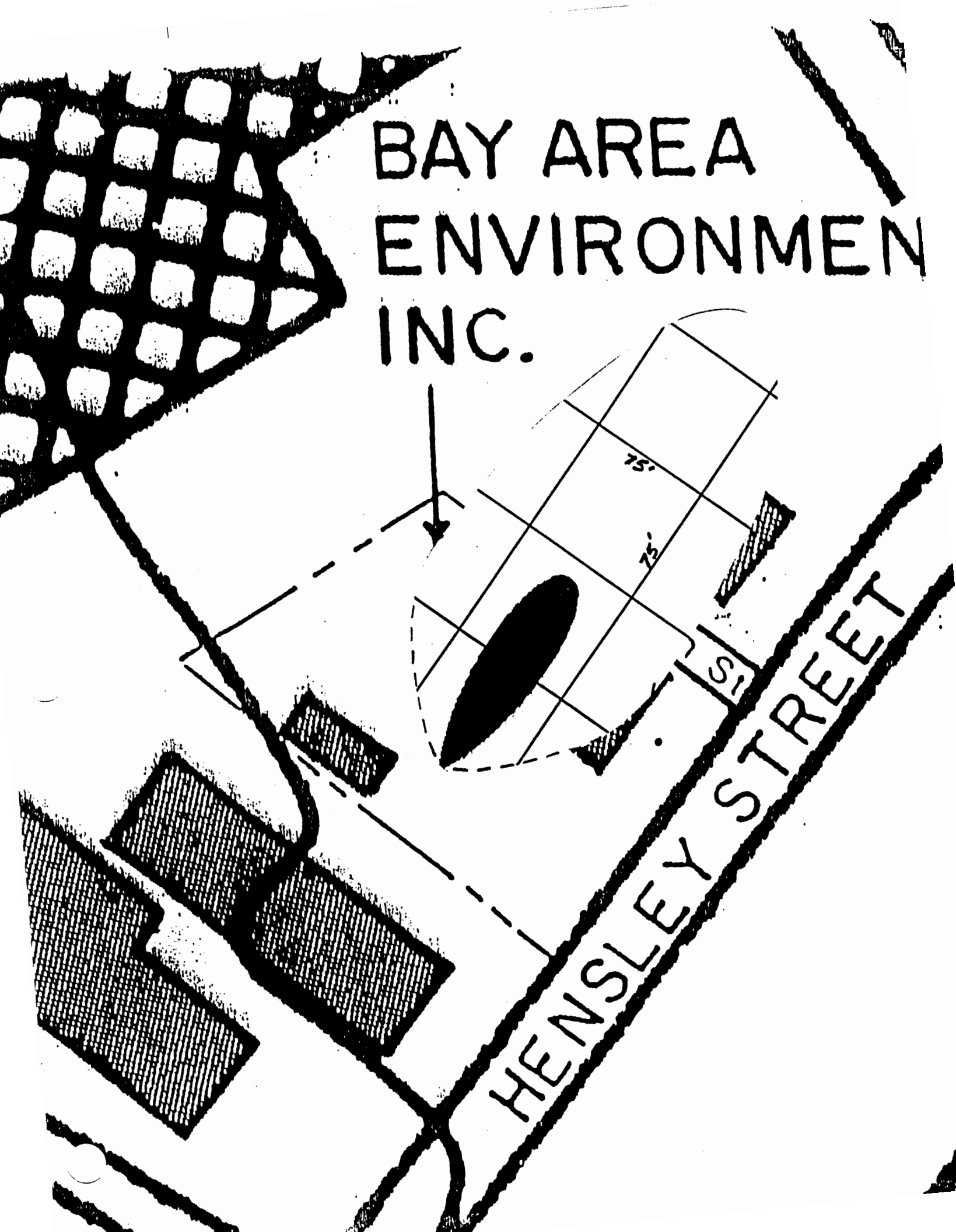
Cameo air model outputs (Aloha Air Model) using two summer conditions:

1. Stable conditions, class = F
2. Unstable conditions, class = A

It is interesting to observe that the two conditions are most prone to occur in the middle of the day (unstable conditions) and the middle of the night (stable conditions). From these results, the zone of highest concentrations would be nearest the facility during the day, whereas at night the highest concentrations would be in a long, narrow plume.




NO RISK OUTSIDE
THIS AREA
LOW
RISK
AREA
HIGH RISK
AREA


BAY AREA
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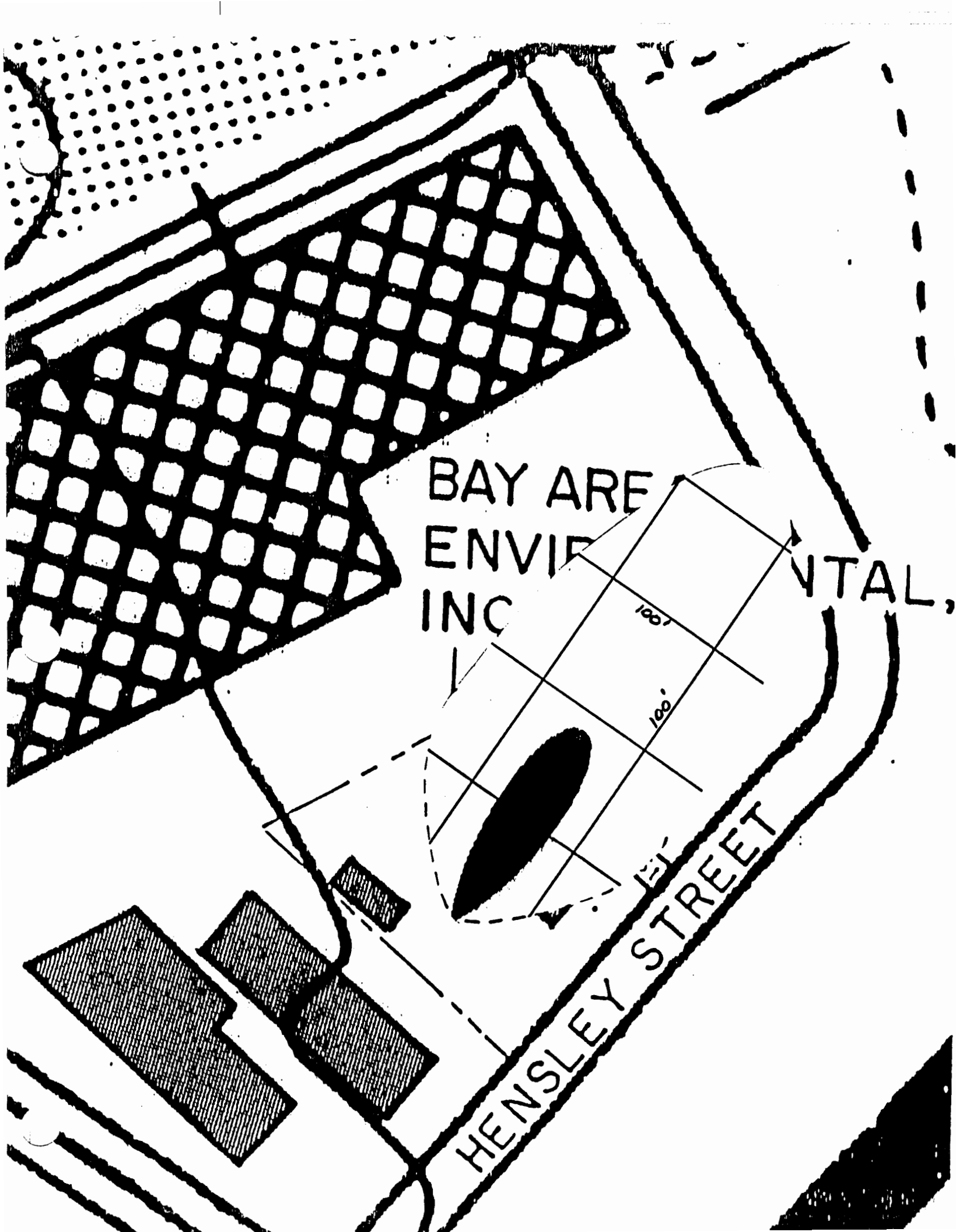
INC.
75'
75'
HENSLEY STREET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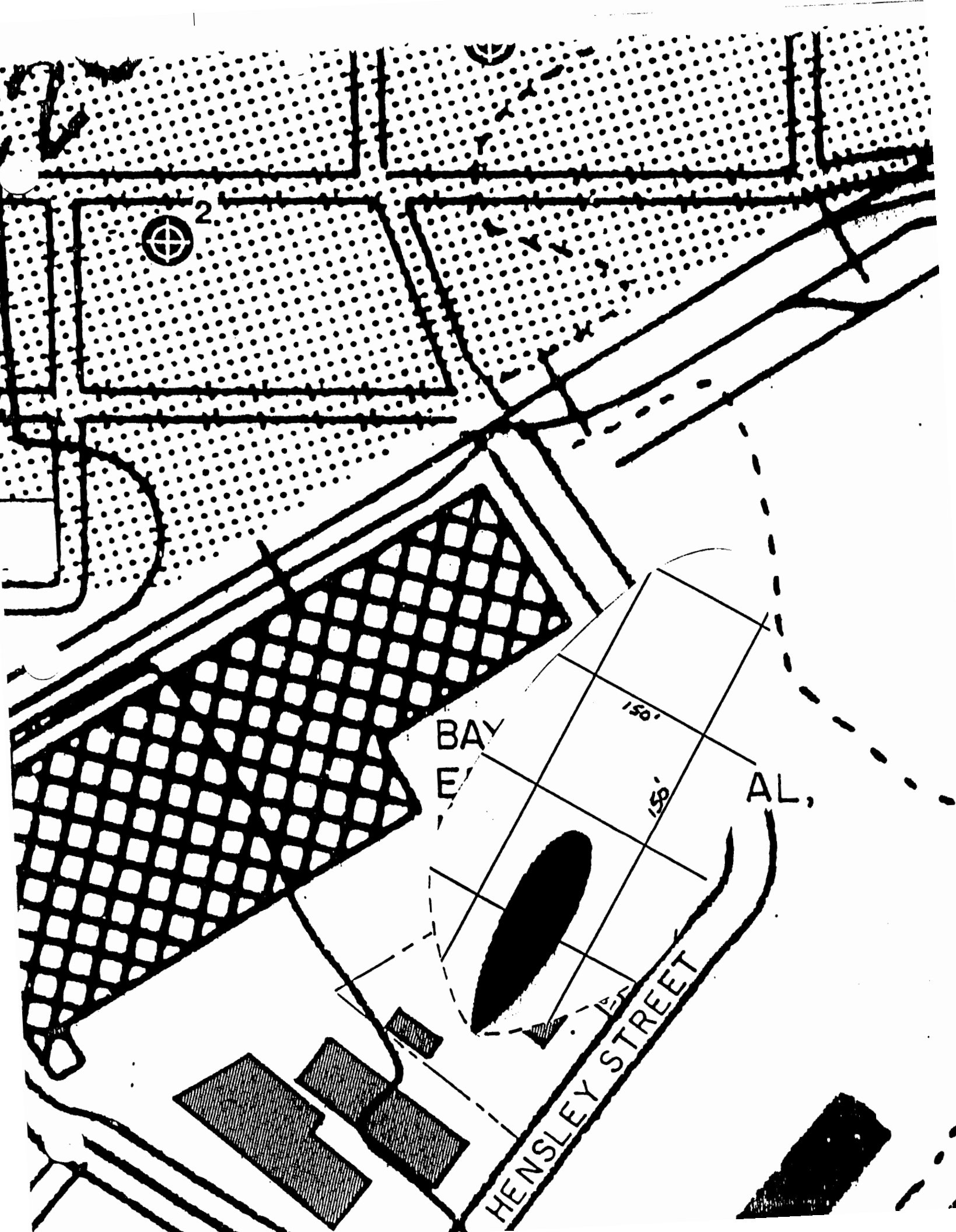
2
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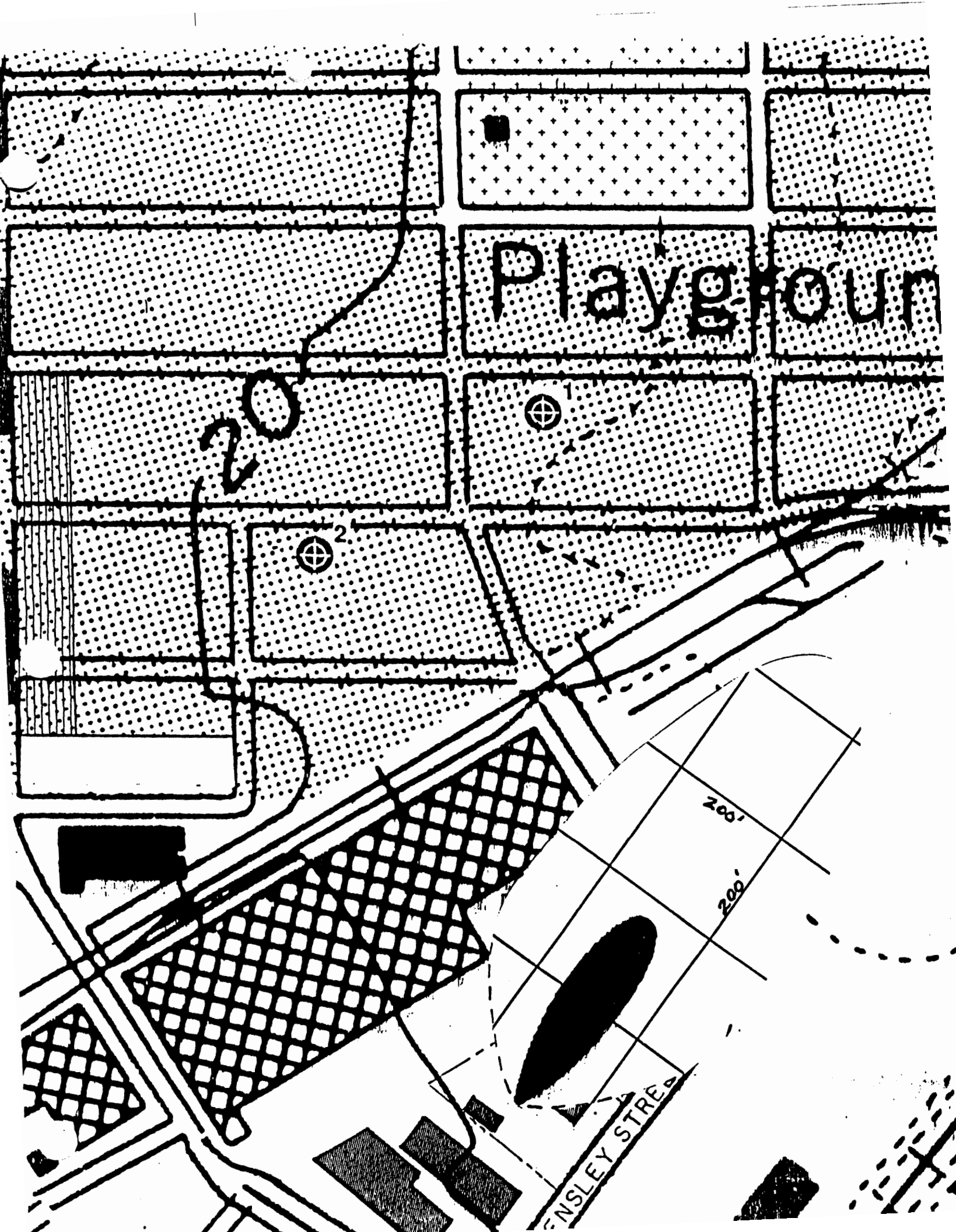
150'
HENSLEY STREET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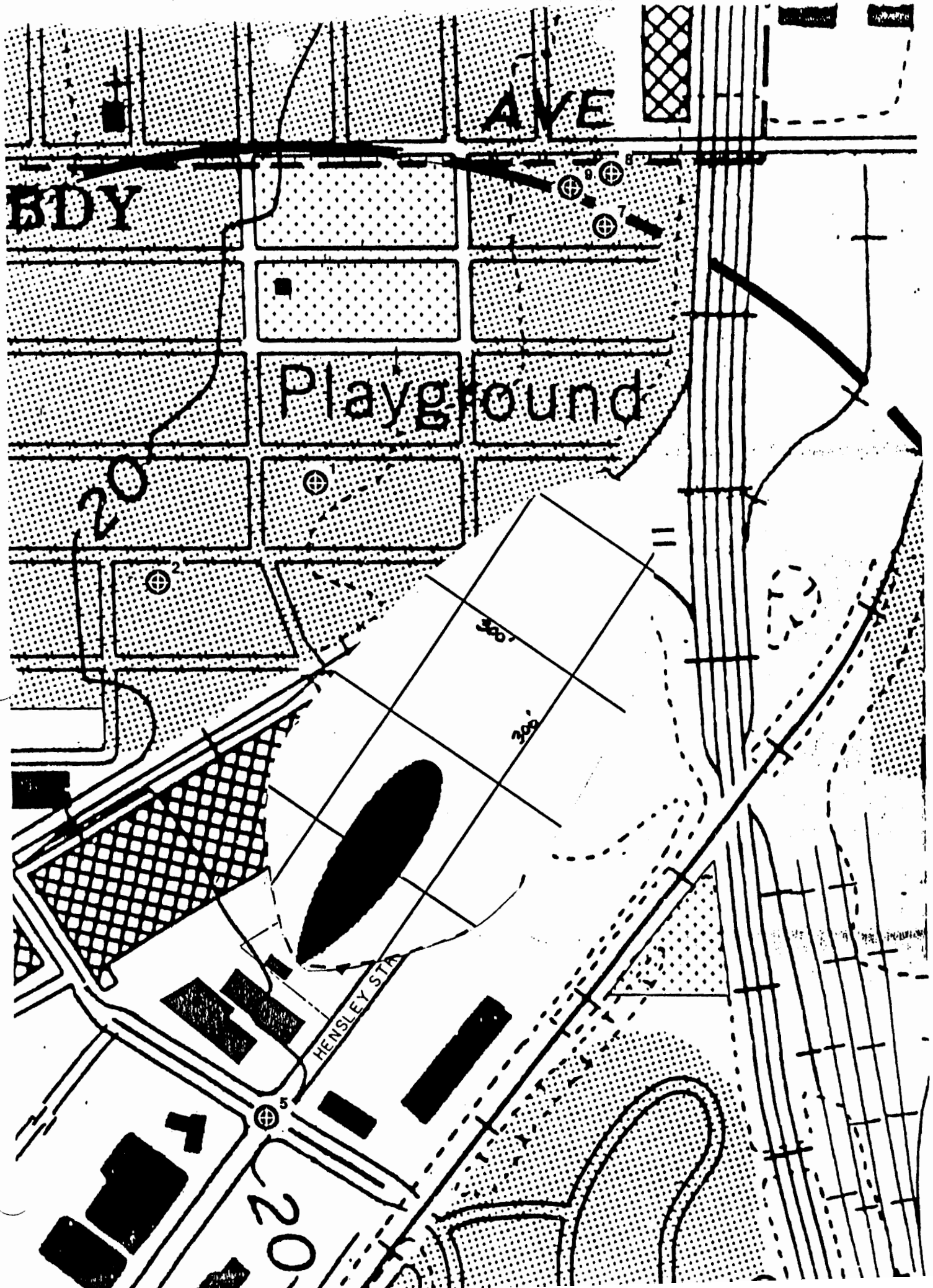
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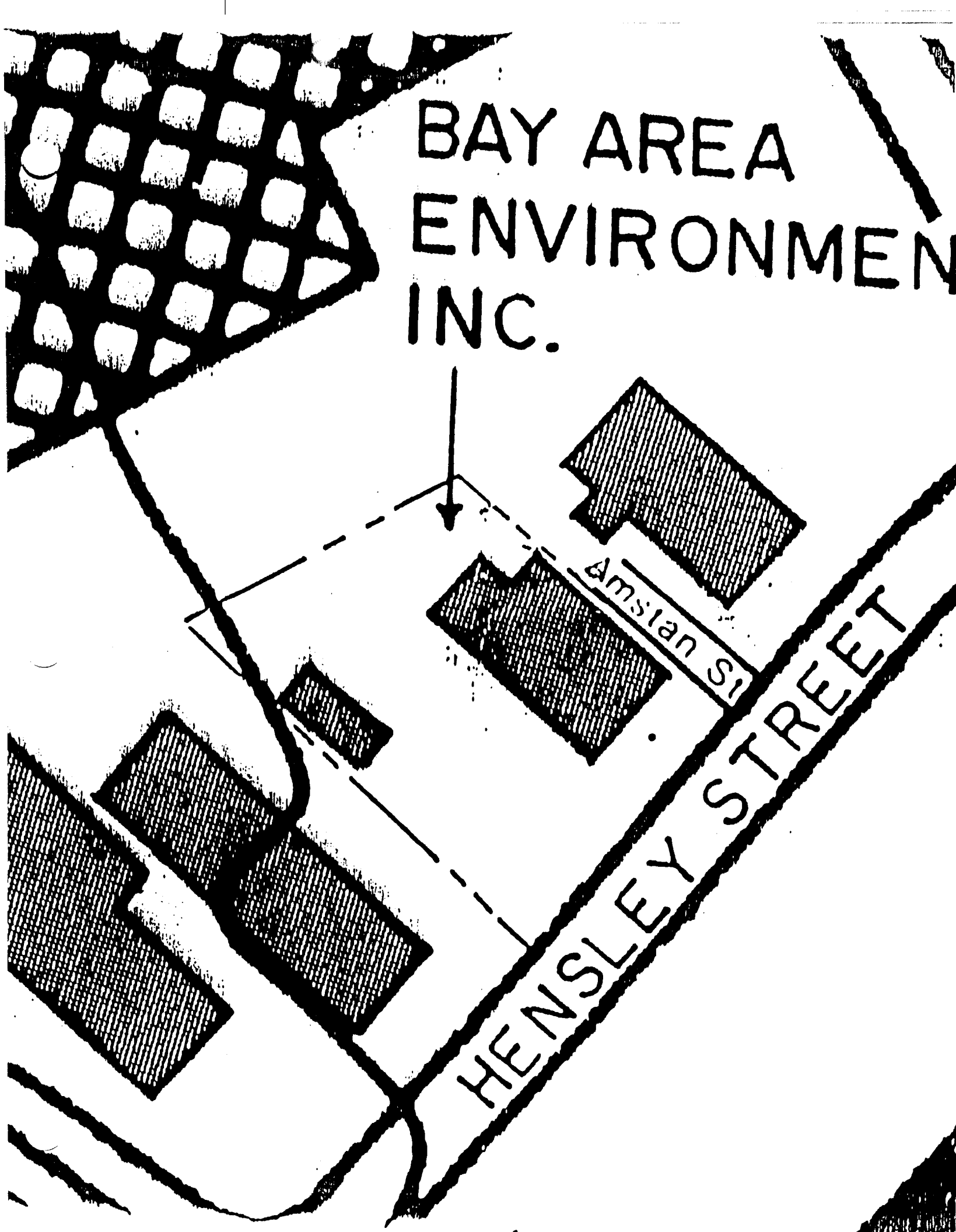
BDY
Playground
20
300'
300'
HENSLEY STA
20


BAY AREA
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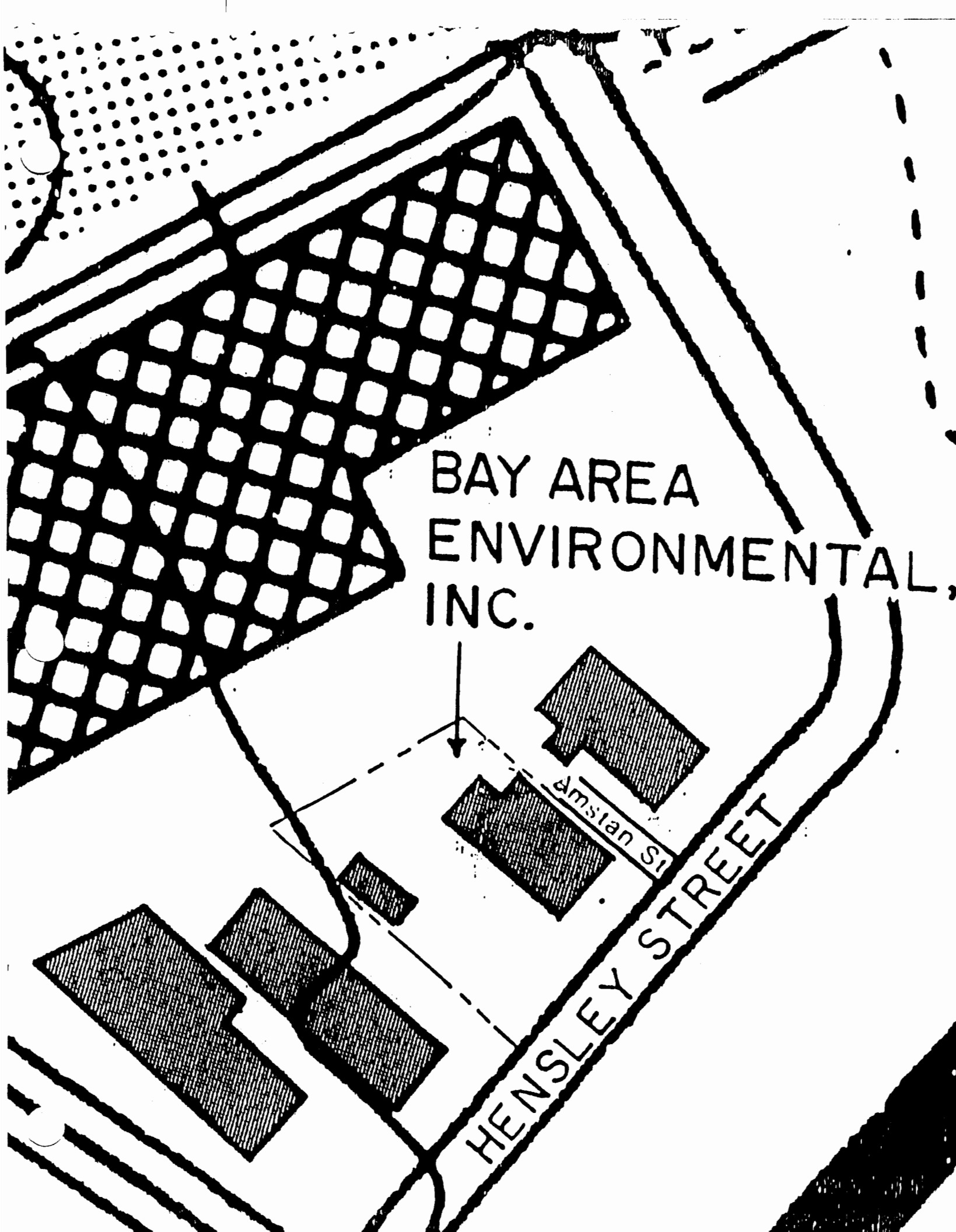
Amstan St
HENSLEY STREET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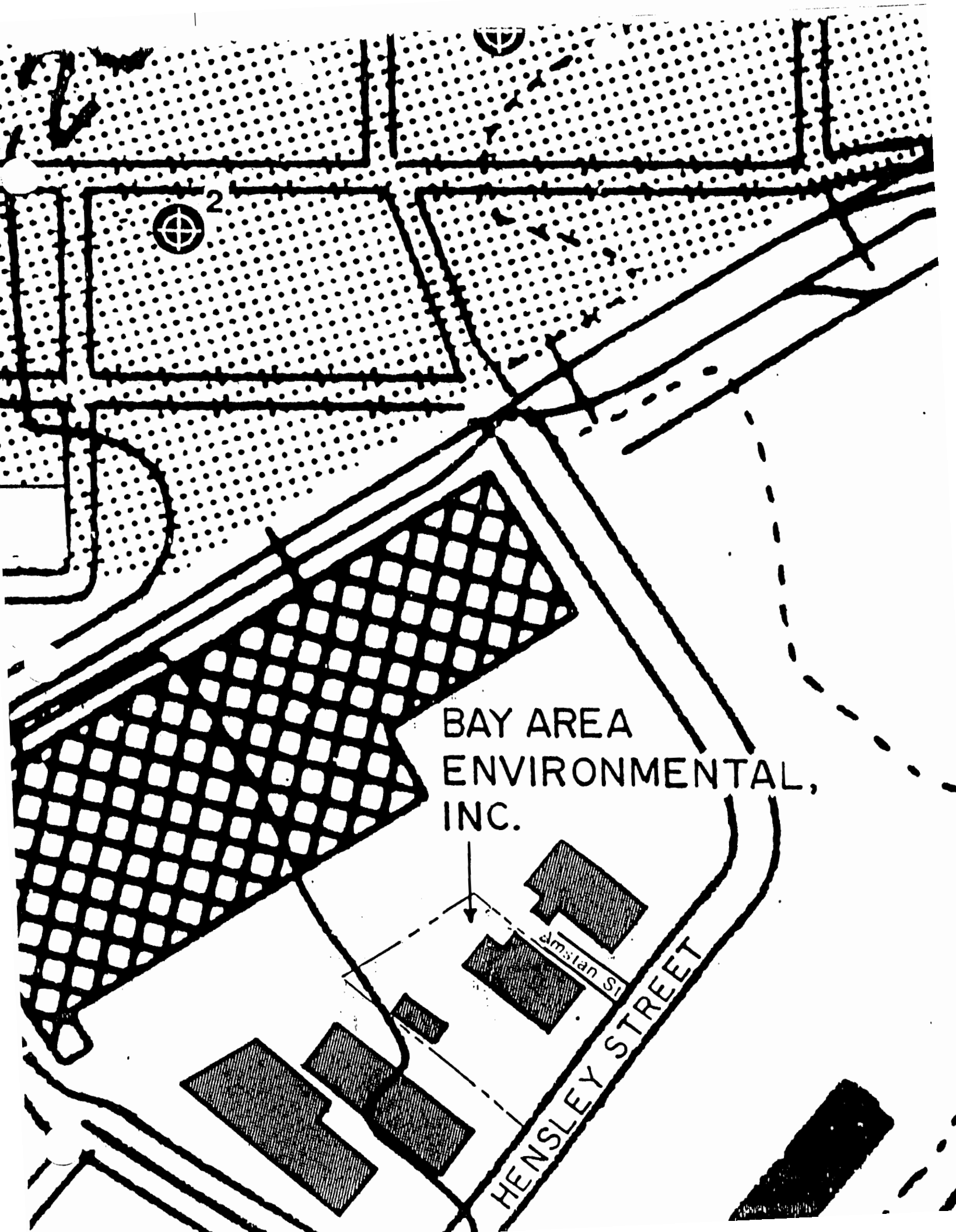
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BAY AREA
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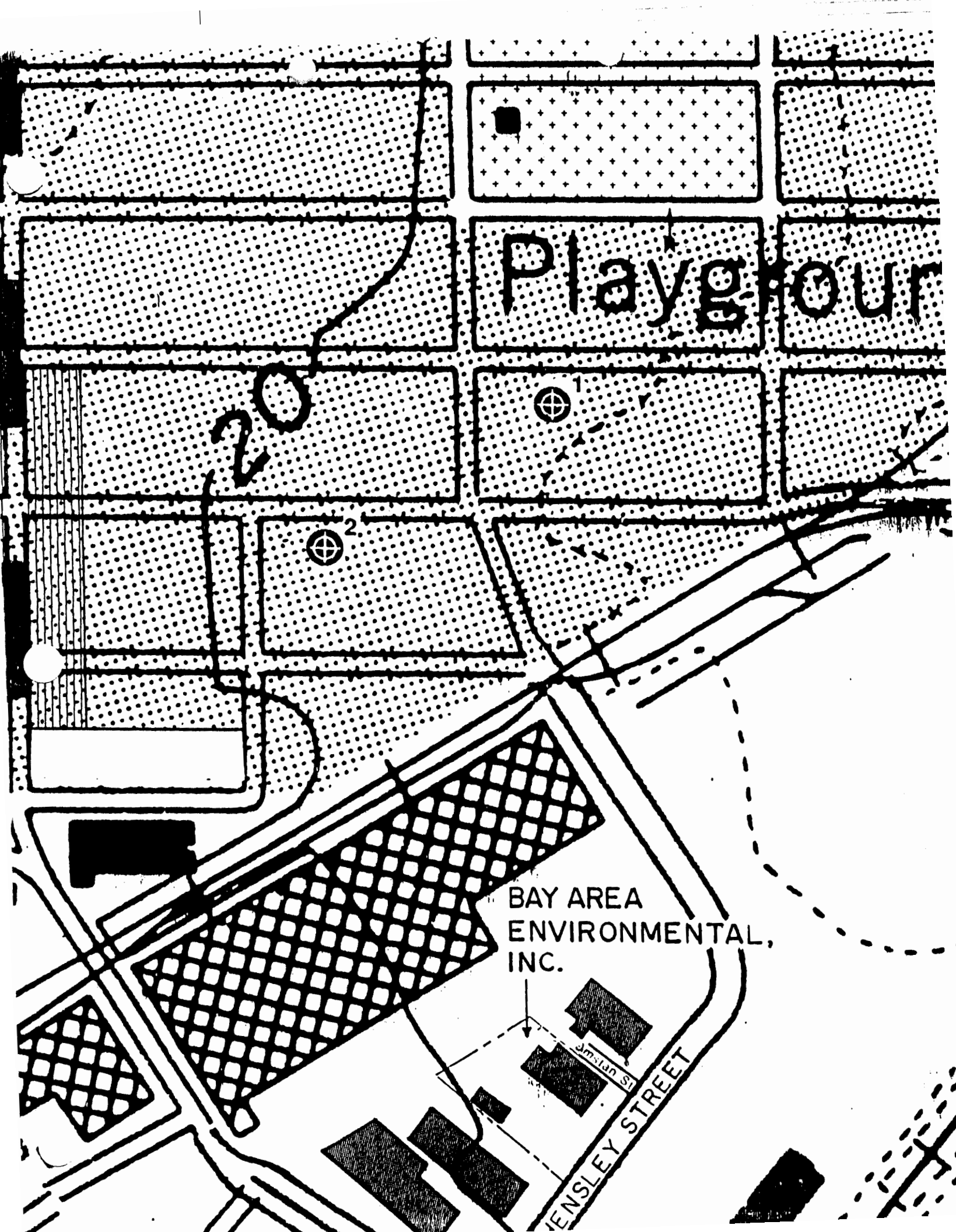
INC.
Hensley St
HENSLEY STREET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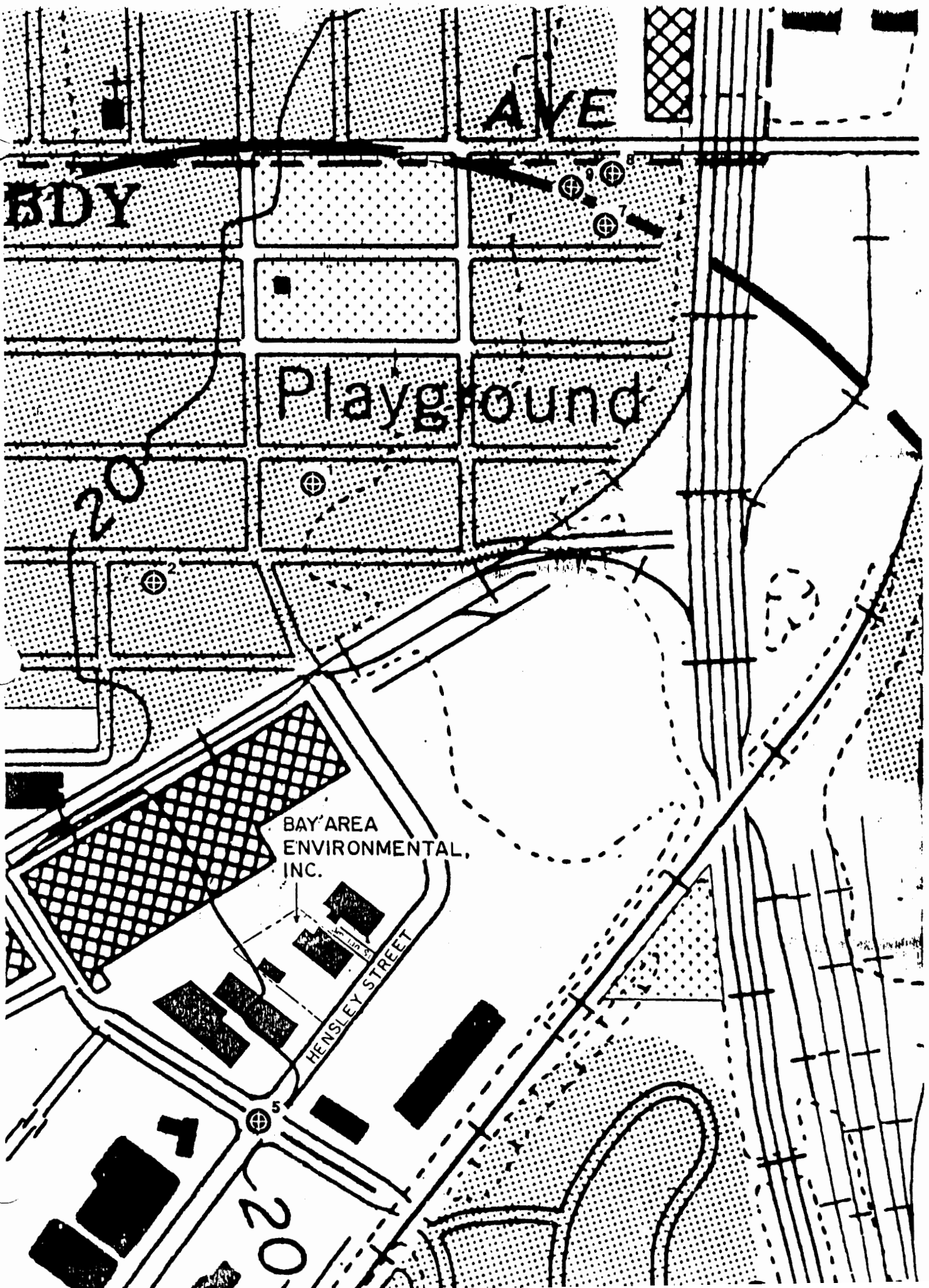
Jamaican St
ENSLEY STREET


AVE
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BAY AREA
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INC.
HENSLEY STREET
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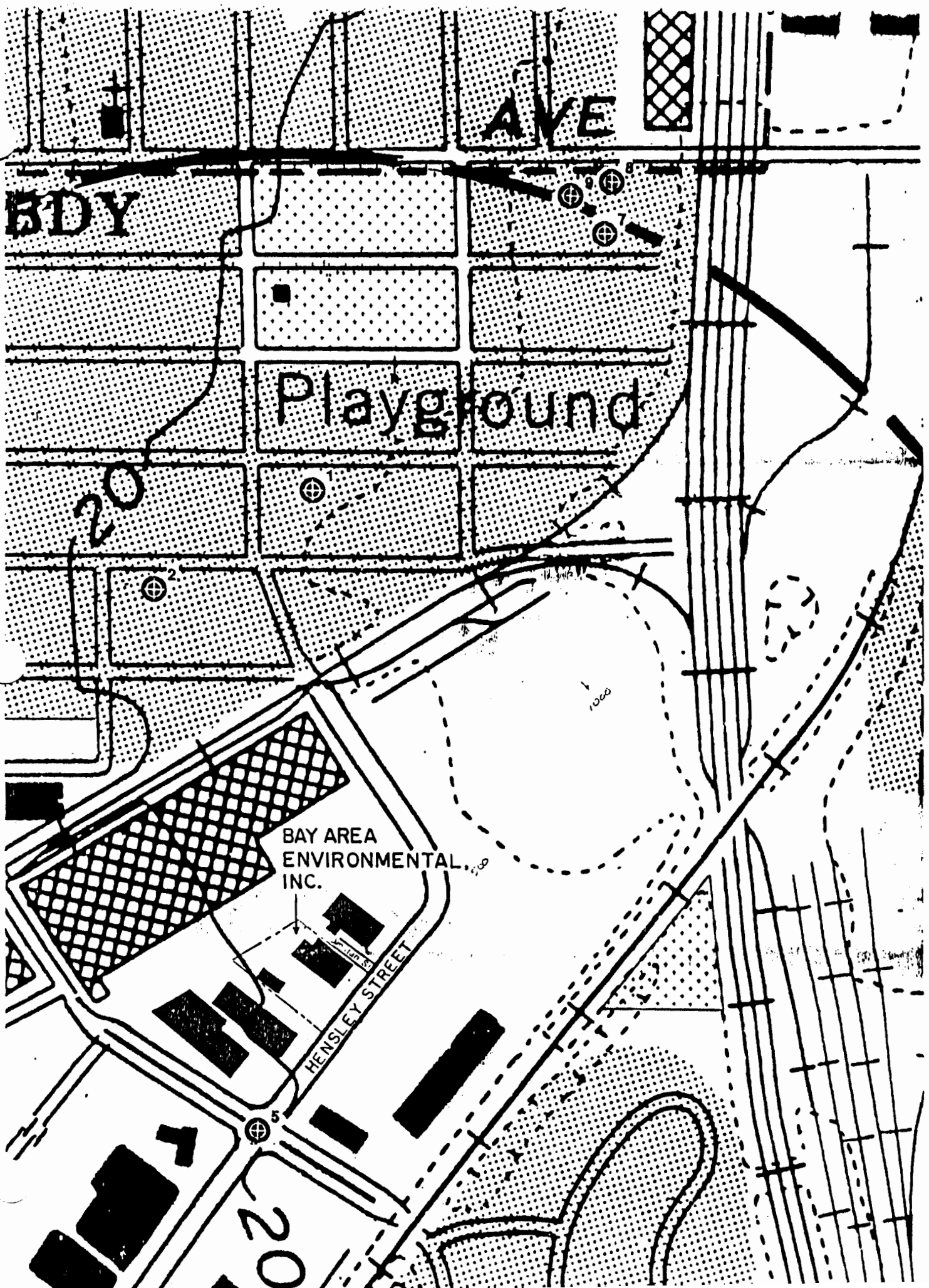
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BAY AREA
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HENSLEY STREET
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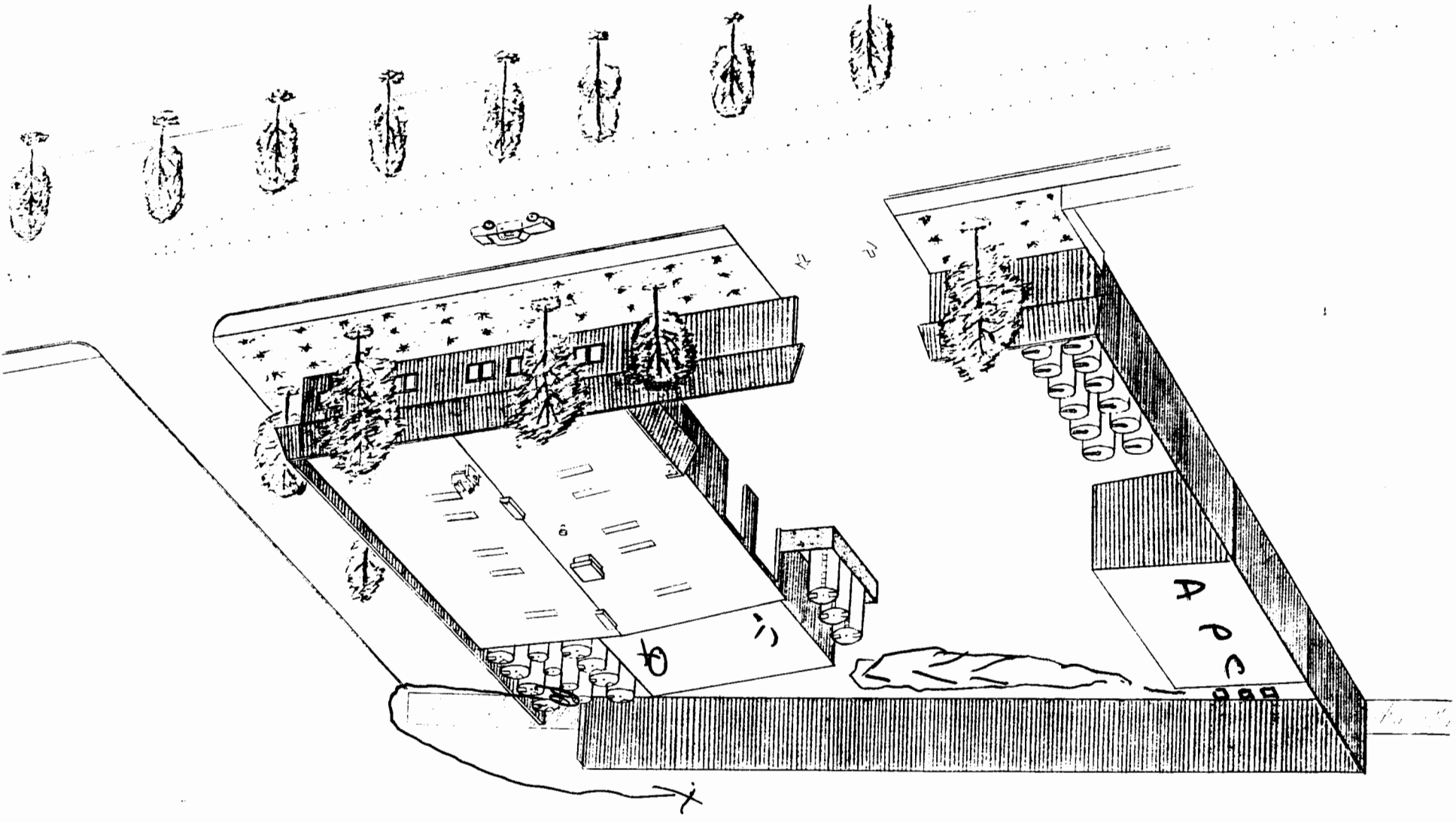

A
B
C

The following soil samples were taken and the pH determined the day after the spill occurred at 6 and 12 inch depthes. The samples were taken at 10 feet intervals throughout the effected area. {Please see sampling plan diagram}.

Sample I.D.	pH at 6"	pH at 12"
10-S-1	6.6	6.9
10-S-2	6.7	7.0
20-S-1	7.4	7.3
20-S-2	7.0	7.8
30-S-1	7.1	7.6
30-S-2	8.2	8.0
40-S-1	4.4	7.7
40-S-2	5.2	7.8
50-S-1	8.2	8.0
50-S-2	8.7	
60-S-1	7.3	
60-S-2	9.0	
60-S-3	8.7	
70-S-1	6.4	
70-S-2	6.5	
70-S-3	6.7	
80-S-1	8.9	7.6
90-S-1	7.5	6.7
90-S-2	4.8	6.4
90-S-3	7.0	6.4
100-S-1		3.5
100-S-2		3.7

Check samples were taken and analyzed by Brown & Cadwell laboratories at 6 and 12 inch depths for chromium, nickle, and acidity.

Sample I.D.	Parameter		
	Cr {mg/kg}	Ni {mg/kg}	Acidity {N}
70-S-2 {6"}	30	5.4	0.005
80-S-1 {6"}	17	3.5	0
100-S-1 {12"}	31	41.0	0.103
100-S-2 {12"}	36	74.0	0.247

The limit set for nickle for this procedure is 20 mg/kg Ni. 41 & 74 mg/kg are both above the limit. Follow up samples ~~are being~~ taken to determined if our facility is clean because of the descrepancies as stated.

SPR

ANDSCAPE LEGEND:

- CHAIN LINK FENCE
- GARDENIA TREE
- FIRETHORN TREE
- GLOSSY ABELIA TREE
- CROTON TREE
- CARMEL CREEPER GROUND COVER
- TRAILING LANTANA GROUND COVER

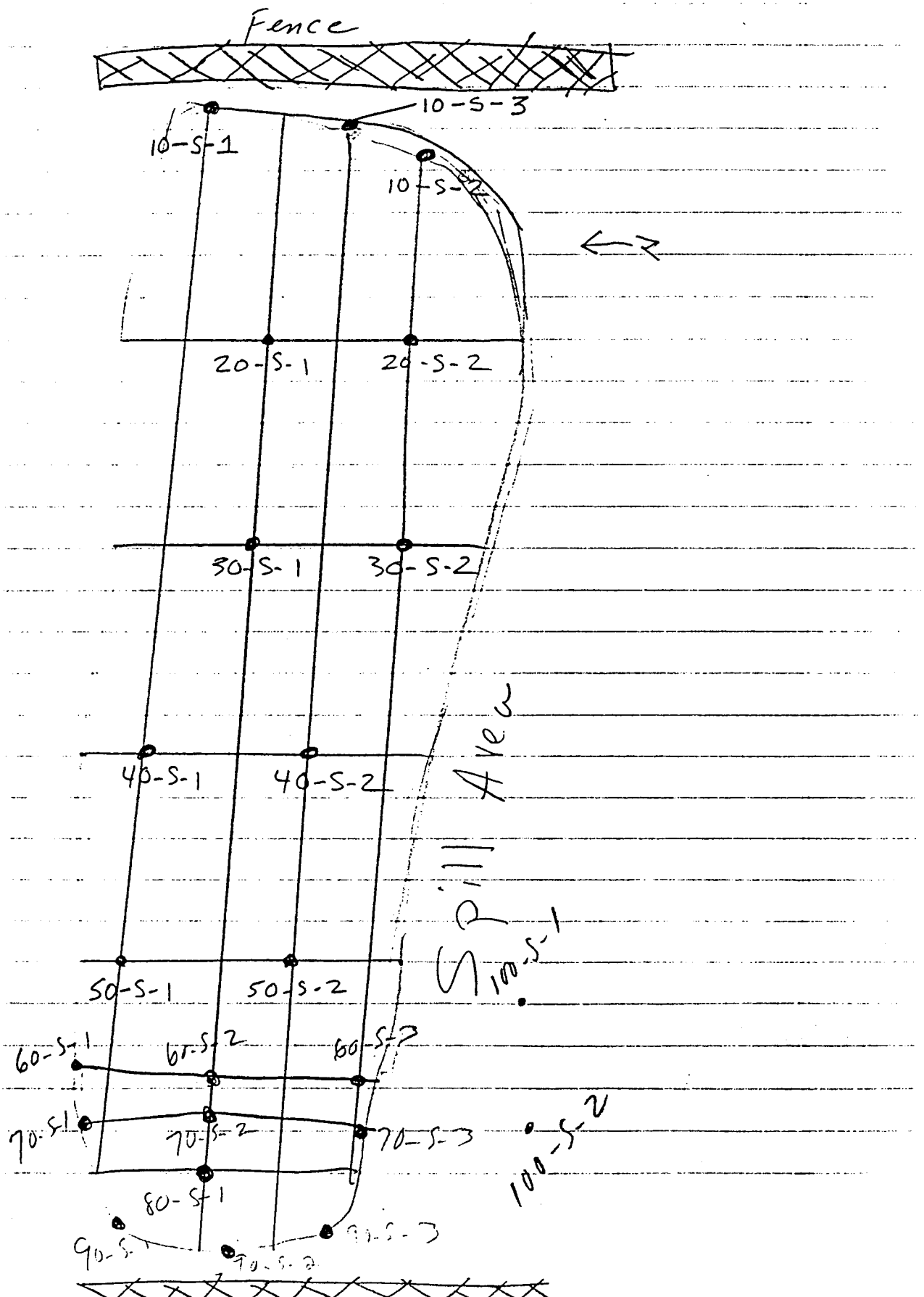
SITE PLAN

1" = 20'

J.J

SHO

VICINITY


Fence
10-S-3
10-S-1
10-S-2
20-S-1
20-S-2
30-S-1
30-S-2
40-S-1
40-S-2
50-S-1
50-S-2
60-S-1
60-S-2
60-S-3
70-S-1
70-S-2
70-S-3
80-S-1
90-S-1
90-S-2
90-S-3
100-S-1
100-S-2
Spring Ave

BAY AREA ENVIRONMENTAL

August 3, 1987

TO: Bob Sisneros, General Manager

FROM: John Tillman, Technical Director

SUBJECT: Acid Spill Analytical Results

The following is a compilation of data obtained from samples taken on our facility during the transfer of acids by Rollins Environmental:

1. Sample taken from one of the tanks involved in the spill; CAM Analysis by Brown & Cadwell.

Constituent	Concentration {Mg/Kg}
Silver {Ag}	.2
Berilium {Be}	<.02
Cadmium {Cd}	7
Tin {Sn}	< 8
Barium {Ba}	.64
Thalium {Ta}	<.5
*Chromium {Cr}	190
Molybelem {Mo}	6
Lead {Pb}	17
Copper {Cu}	320
*Nickel {Ni}	24,000
Zinc {Zn}	120
Cobalt {Co}	59
Vanadium {Va}	1.2
Arsenic {As}	< .3
Selenium {Se}	< .4
Mercury {Hg}	2.8

*The DOHS has set limits for Cr at 560 mg/kg and Ni at 2000 mg/kg.

The following liquid sampler were taken from the ground during the spillage. Five {5} samples were taken from liquid pools in the yard. BAE-001 was closest to the spill site and BAE-005 was furthest from the spill site.

Sample I.D.	Parameter {mg/e}		Parameter {Normality}	
	Cr	Ni	Acidity	pH
BAE-001	150	37000		
BAE-002	160	34000		
BAE-003	130	31000		
BAE-004	120	34000		
BAE-005	120	29000	6.92	0.8

1125 HENSLEY ST. RICHMOND, CA 94804
(415) 233-8001

BAY AREA ENVIRONMENTAL

August 3, 1987

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FROM: John Tillman, Technical Director

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Lead {Pb}	17
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Zinc {Zn}	120
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Sample I.D.	Parameter {mg/e}		{Normality}	
	Cr	Ni	Acidity	pH
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1125 HENSLEY ST. RICHMOND, CA 94804
(415) 233-8001

BROWN AND CALDWELL LABORATORIES

1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E87-07-439

Received: 23 JUL 87
Reported: 03 AUG 87

Mr. John Tillman
Bay Area Environmental
1125 Hensley Street
Richmond, California 94804

Project: 7-00199-87

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, LIQUID SAMPLES	DATE SAMPLED
07-439-1	ROLL-001	23 JUL 87

PARAMETER	07-439-1
Antimony, mg/kg	<8
Arsenic, mg/kg	<0.3
Barium, mg/kg	0.64
Beryllium, mg/kg	<0.02
Cadmium, mg/kg	7.0
Chromium, mg/kg	190
Cobalt, mg/kg	59
Copper, mg/kg	320
Lead, mg/kg	17
Mercury, mg/kg	2.8
Molybdenum, mg/kg	6
Nickel, mg/kg	24,000
Selenium, mg/kg	<0.4
Silver, mg/kg	0.2
Thallium, mg/kg	<5
Vanadium, mg/kg	1.2
Zinc, mg/kg	120
Nitric Acid Digestion, Date	07.24.87

Verbal results given to Joe Lynch 7/28/87

Linda Bracken for
D. A. McLean, Laboratory Director

BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E87-07-425

Received: 23 JUL 87
Reported: 04 AUG 87

Mr. John Tillman
Bay Area Environmental
1125 Hensley Street
Richmond, California 94804

Project: 7-00199-87

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
07-425-1	70-5-2(6")	21 JUL 87
07-425-2	80-5-1(6")	21 JUL 87
07-425-3	100-5-1(12")	21 JUL 87
07-425-4	100-5-2(12")	21 JUL 87

PARAMETER	07-425-1	07-425-2	07-425-3	07-425-4
Nitric Acid Digestion, Date	07.24.87	07.24.87	07.24.87	07.24.87
Acidity (as CaC03), mg/kg	<500	<500	45000	110000
Chromium, mg/kg	30	17	31	36
Nickel, mg/kg	54	35	410	240

The acidity can be converted to normality as follows:
(N)(V) = (N)(V) (0.1087)(V) = N(wt,g)
-1 0.005
-2 0.0
-3 0.103
-4 0.247

D. A. McLean, Laboratory Director

BROWN AND CALDWELL LABORATORIES
1255 POWELL STREET EMERYVILLE, CA 94608 • (415) 428-2300

ANALYTICAL REPORT

LOG NO: E87-07-350

Received: 21 JUL 87
Reported: 22 JUL 87

Mr. John Tillman
Bay Area Environmental
1125 Hensley Street
Richmond, California 94804

Project: BAE Acid Test

REPORT OF ANALYTICAL RESULTS

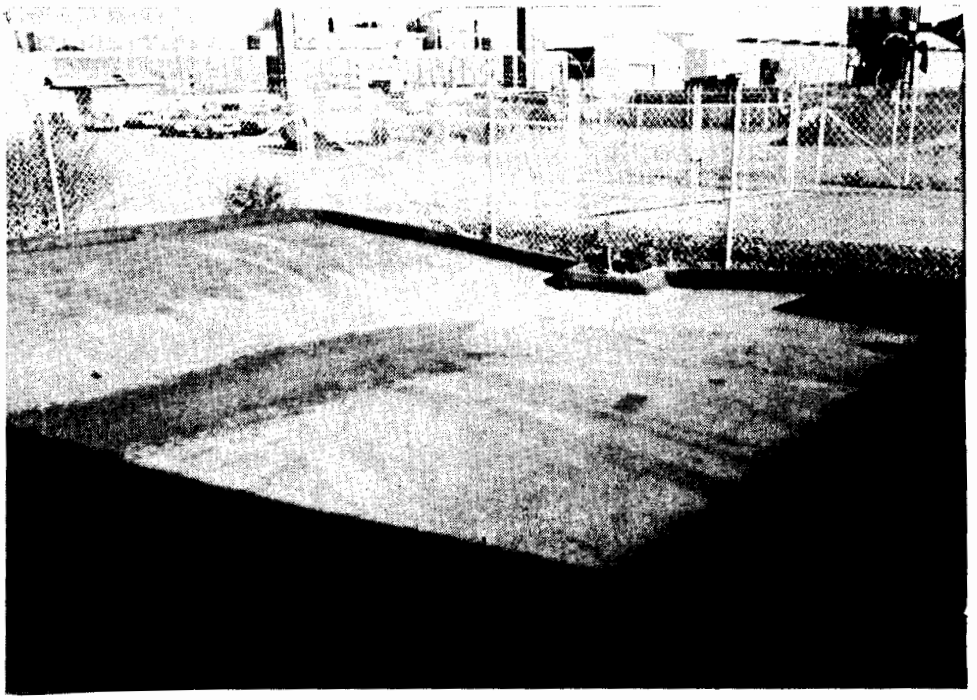
LOG NO	SAMPLE DESCRIPTION, LIQUID SAMPLES	DATE SAMPLED
07-350-1	BAE-001	21 JUL 87
07-350-2	BAE-002	21 JUL 87
07-350-3	BAE-003	21 JUL 87
07-350-4	BAE-004	21 JUL 87
07-350-5	BAE-005	21 JUL 87

PARAMETER	07-350-1	07-350-2	07-350-3	07-350-4	07-350-5
Acidity (as CaCO3), mg/L	---	---	---	---	350000
Chromium, mg/L	150	160	130	120	120
Nickel, mg/L	37000	34000	31000	34000	29000
Nitric Acid Digestion, Date	07.21.87	07.21.87	07.21.87	07.21.87	07.21.87

The acidity can be converted to normality as follows:
$(N)(V) = (N)(V)$ $(0.0208)(16.63) = (N)(0.05)$
$(N) = 6.92$

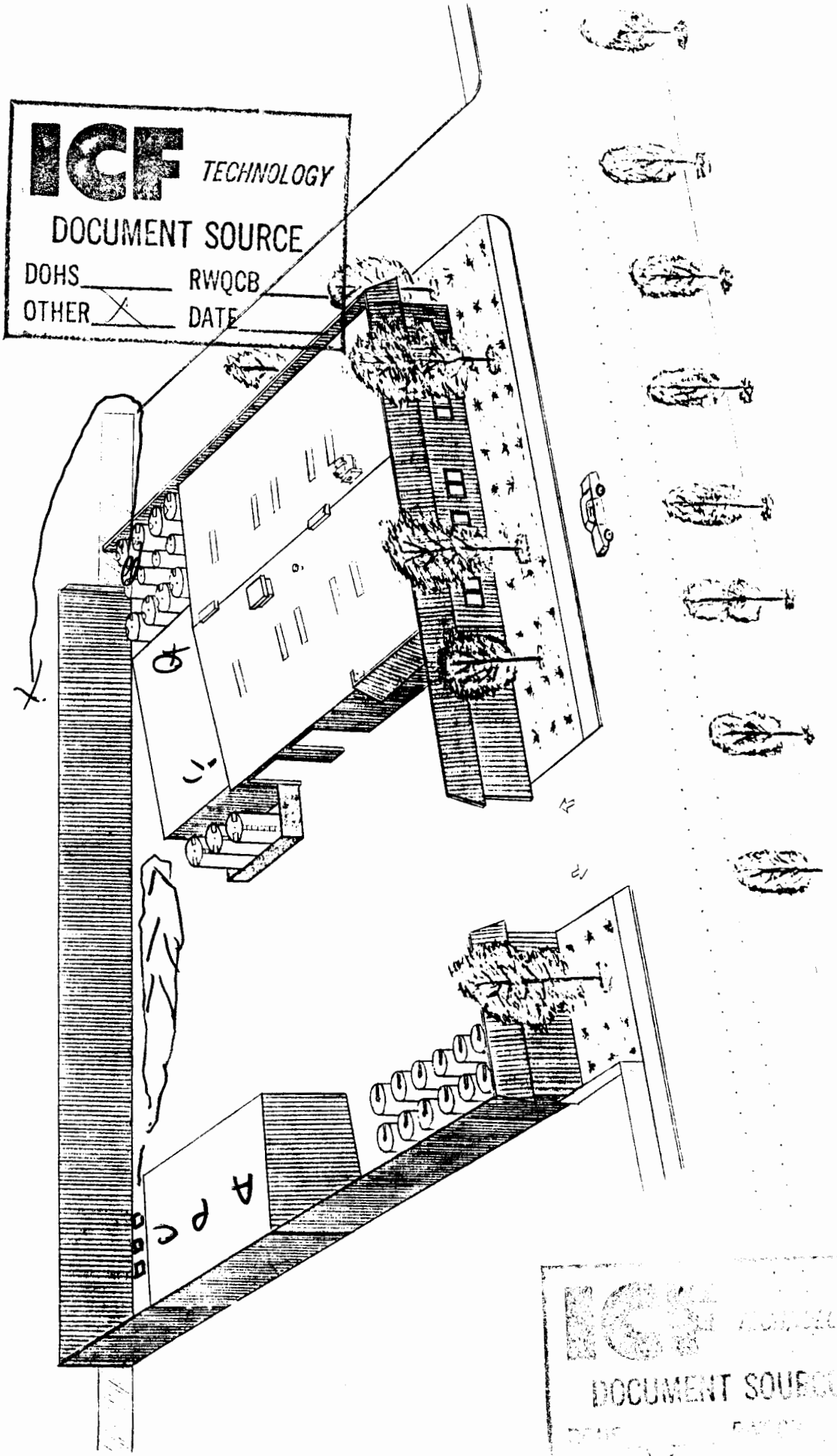
Linda Brack for
D. A. McLean, Laboratory Director

BAY AREA ENVIRONMENTAL, INC.
WASTE MANAGEMENT SERVICES



LOADING YARD
CONTAINMENT AREA
(1,100 GALLON CAPACITY)

LOCKED DISCHARGE VALVE FOR
THE YARD CONTAINMENT AREA



The following soil samples were taken and the pH determined the day after the spill occurred at 6 and 12 inch depthes. The samples were taken at 10 ret intervals throughout the effected area. {Please see sampling plan diagram}.

Sample I.D.	pH at 6"	pH at 12"
10-S-1	6.6	6.9
10-S-2	6.7	7.0
20-S-1	7.4	7.3
20-S-2	7.0	7.8
30-S-1	7.1	7.6
30-S-2	8.2	8.0
40-S-1	4.4	7.7
40-S-2	5.2	7.8
50-S-1	8.2	8.0
50-S-2	8.7	
60-S-1	7.3	
60-S-2	9.0	
60-S-3	8.7	
70-S-1	6.4	
70-S-2	6.5	
70-S-3	6.7	
80-S-1	8.9	7.6
90-S-1	7.5	6.7
90-S-2	4.8	6.4
90-S-3	7.0	6.4
100-S-1		3.5
100-S-2		3.7

Check samples were taken and analyzed by Brown & Cadwell laboratories at 6 and 12 inch depths for chromium, nickle, and acidity.

Sample I.D.	Parameter		
	Cr {mg/kg}	Ni {mg/kg}	Acidity {N}
70-S-2 {6"}	30	5.4	0.005
80-S-1 {6"}	17	3.5	0
100-S-1 {12"}	31	41.0	0.103
100-S-2 {12"}	36	74.0	0.247

The limit set for nickle for this procedure is 20 mg/kg Nl. .41 & 74 mg/kg are both above the limit. Follow up samples are being taken to determined if our facility is clean because of the descrepancies as stated.

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50-S-2	8.7	
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60-S-3	8.7	
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70-S-3	6.7	
80-S-1	8.9	7.6
90-S-1	7.5	6.7
90-S-2	4.8	6.4
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BAY AREA ENVIRONMENTAL

August 3, 1987

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1125 HENSLEY ST. RICHMOND, CA 94804
(415) 233-8001

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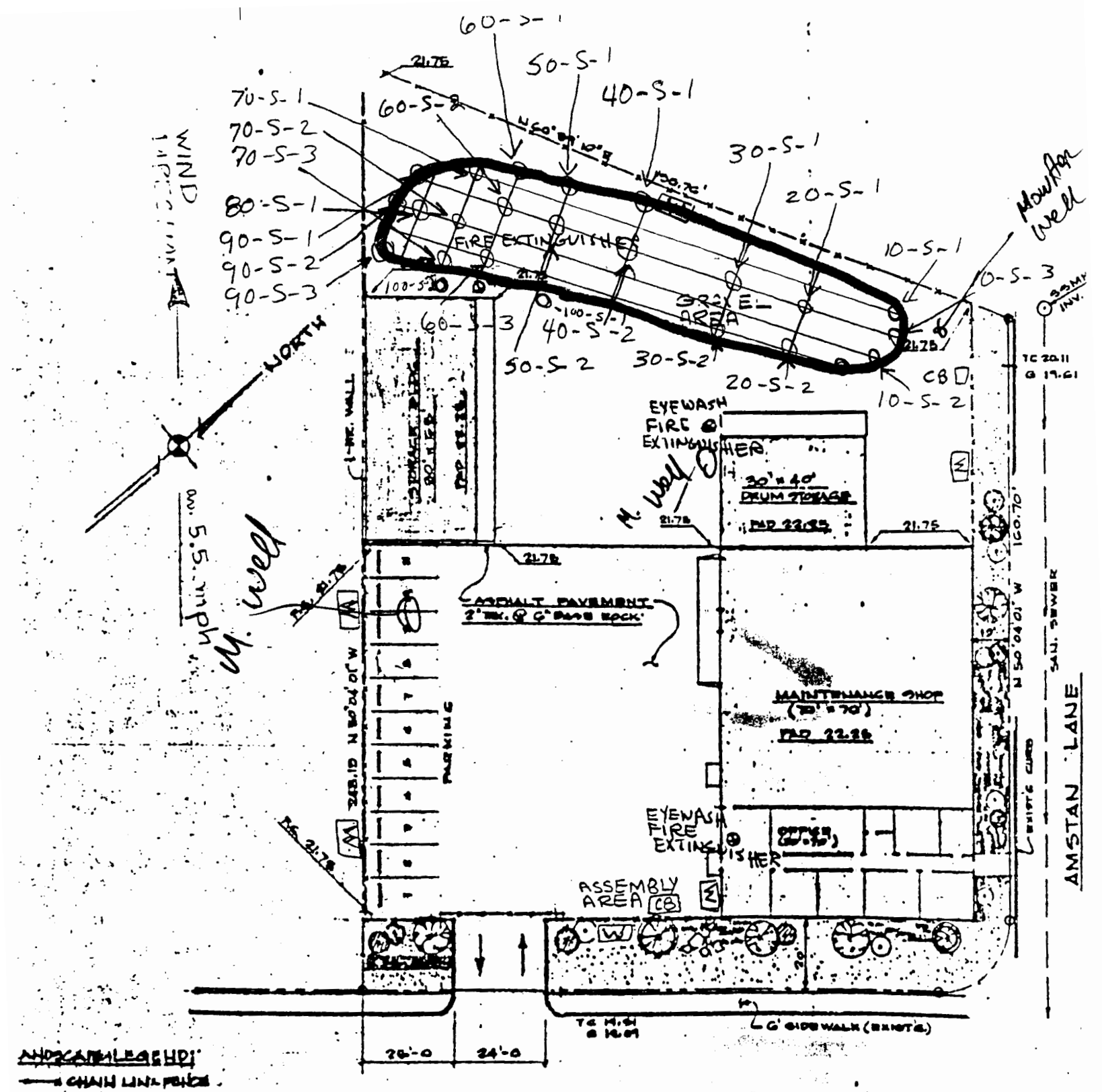
1125 HENSLEY ST. RICHMOND, CA 94804
(415) 233-8001



LANDSCAPE LEGEND

- CHAIN LINK FENCE
- GARDENIA TREE
- FIRETHORN TREE
- GLOSSY ABELIA TREE
- CROTON TREE
- CARMEL CREEPER GROUND COVER
- TRAILING LANTANA GROUND COVER

SITE PLAN

1" = 20'

BAY AREA ENVIRONMENTAL

Richmond, California

SUMMARY SHEET OF WASTE RECEIVED

Receipt No.	Date	Name & Address	Type of Waste	Volume	Notes
87041625	7-1-87	East Bay MUD 5601 Oakport Avenue Oakland, CA 94623	Flammable ORM-A	8 x 55-gallon 1 x 55-gallon	waste solvent chlorinated solvent
87328262	7-1-87	California State Prison-Folsom P.O. Box W Represa, CA 95671	Poison	1 x 55-gallon	cyanide solution
87041621	7-1-87	Mt. Diablo Hospital 2540 East Street Concord, CA 94520	Poison	3 x 55-gal	biologicals specimens in formaldehyde
87087289	7-2-87	Sonoma County Sheriff Office 600 Administrative Drive Santa Rosa, CA 94501	ORM-A	2 x 55-gal 1 gal	waste carbontetrachloride per each 55 gal Open
86260605	7-2-87	California Oil Recyclers 977 A Beansien San Carlos, CA 94070	ORM-E	39 x 55-gall	empty containers previously oil 7950 lbs
87041627	7-6-87	East Bay MUD 5601 Oakport Avenue Oakland, CA	ORM-E	1 x 55-gallon	waste paint solids, rain water
87041629	7-7-87	Pharmex Ltd. 1499 67th Street Emeryville, CA	Flammable	1 x 55-gallon	isobutyl nitrite
87005736	7-13-87	Environmental Protection c/o DRMO, Bldg. #6 2155 Mariner Square Loop Alameda, CA 94501	Corrosive	18 x 55-gallon	waste mixed acids
87137324	7-9-87	Contra Costa County/ DOHS Environmental Health Division 1111 Ward Street Martinez, CA 94553	Corrosive	1 x 55-gal	

Form 2 8/83

State of California—Health and Welfare Agency
Form Approved OMB No. 2050—0039 (Expires 9-30-
Please print or type. *(Form designed for use on elite (12-pitch typewriter).*

Entered 4/88

Department of Health Services
Toxic Substances Control Division
Sacramento, California

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. CAT080014079 Manifest Document No. 9999M

2. Page 1 of 1 — Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Bay Area Environmental
1125 Hensley Street, Richmond, CA 94801
4. Generator's Phone (415) 233-8001

A. State Manifest Document Number 87041653
B. State Generator's ID HAH03601895 2
C. State Transporter's ID 800317
D. Transporter's Phone 415-724-2851

5. Transporter 1 Company Name: Martinez Industrial
6. US EPA ID Number: CAD981425911
7. Transporter 2 Company Name:
8. US EPA ID Number:
E. State Transporter's ID:
F. Transporter's Phone:

9. Designated Facility Name and Site Address
Chemical Waste Management
3521 Old Skyline Road
Kettleman Hills, CA 93239
10. US EPA ID Number: CAT000646117
G. State Facility's ID: CAT000646117
H. Facility's Phone: 800-222-2964

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. Hazardous Waste, Solid, N.O.B., ORM-E NA #9189	001	CM	20	Y	State 611 / EPA/Other exempt
b.					State / EPA/Other
c.					State / EPA/Other
d.					State / EPA/Other

J. Additional Descriptions for Materials Listed Above
Acid spill clean up residue
Profile # SFO 616789

K. Handling Codes for Wastes Listed Above
a. 03 b. c. d.

15. Special Handling Instructions and Additional Information
Wear protective clothing

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR — Printed/Typed Name: Joe Lynch — Signature: Joe — Month Day Year: 07 24 87

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Robert L. Ekis — Signature: Robert L. Ekis — Month Day Year: 07 24 87

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name: — Signature: — Month Day Year:

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: Stephen Pickell — Signature: Stephen Pickell — Month Day Year: 07 24 87

IN CASE OF AN EMERGENCY OR SPILL, CALL THE NATIONAL RESPONSE CENTER 1-800-424-8802; WITHIN CALIFORNIA CALL 1-800-852-7550

87041653

DHS 8022 A (1/87)
EPA 8700—22
(Rev. 9-86) Previous editions are obsolete.

Yellow: TSDF SENDS THIS COPY TO GENERATOR WITHIN 30 DAYS

INSTRUCTIONS ON THE BACK

State of California—Health and Welfare Agency
Form Approved OMB No. 2050—0039 (Expires 9-3(
Please print or type. (Form designed for use on eli... 12-pitch typewriter).

DLA·DW·STD·0032 Profile # Entered 6.6789 4/8/87 D.C. 0066

Department of Health Services
Toxic Substances Control Division
Sacramento, California

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. / Manifest Document No.	CIAT0S10101146171
2. Page 1 of 1	Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
BAY AREA ENVIRONMENTAL
1125 HENSLEY
RICHMOND, CA 94804
4. Generator's Phone (415) 233-8001

A. State Manifest Document Number: 87005900
B. State Generator's ID: CIAT0S10101146171
C. State Transporter's ID: 767524
D. Transporter's Phone: 707-746-0697
E. State Transporter's ID:
F. Transporter's Phone:

5. Transporter 1 Company Name: UNIVERSAL ENGINEERING
6. US EPA ID Number: CIATUS10101134167
7. Transporter 2 Company Name:
8. US EPA ID Number:

9. Designated Facility Name and Site Address
CHEMICAL WASTE MANAGEMENT INC.
35251 OLD SKYLINE RD.
KETTLEMAN CITY, CA 93239
10. US EPA ID Number: CIAT0101614611117

G. State Facility's ID: CIAT0101644611117
H. Facility's Phone: (209) 386-9711

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. HAZARDOUS WASTE, SOLID, N.O.S., (CRM-E NA 1181	001	CM	0019	Y	State 611 / EPA/Other N/A
b.					State / EPA/Other
c.					State / EPA/Other
d.					State / EPA/Other

J. Additional Descriptions for Materials Listed Above
a) Acid Spill Clean-up Neutralized / Mist. w Soda Ash Removed, Truck Overweight. AT BAE LINES: 2, 3, 13, 14,

K. Handling Codes for Wastes Listed Above
a. 03 b. c. d.

15. Special Handling Instructions and Additional Information
CAUTION: USE PROTECTIVE GEAR, SAFETY GLASSES & RUBBER GLOVES.

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

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Printed/Typed Name	Signature	Month Day Year
DAVID Burton	David Burton	10 12 87

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year
William J Taylor	William J Taylor	10 12 87

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month Day Year
Stephen Pickett	Stephen Pickett	10 23 87

IN CASE OF AN EMERGENCY OR SPILL, CALL THE NATIONAL RESPONSE CENTER 1-800-424-8802; WITHIN CALIFORNIA CALL 1-800-852-7550

87005900

GENERATOR

DHS 8022 A (1/87)
EPA 8700—22
(Rev. 9-86) Previous editions are obsolete.

Yellow: TSDF SENDS THIS COPY TO GENERATOR WITHIN 30 DAYS

INSTRUCTIONS ON THE BACK

State of California—Health and Welfare Agency
Form Approved OMB No. 2050—0039 (Expires 9-30-8
Please print or type. (Form designed for use on elite (12-pitch typewriter).

DCA 200-87D-0032 P.O. 0066 Entered 4/8 G1

Department of Health Services
Toxic Substances Control Division
Sacramento, California

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of 1	Information in the shaded areas is not required by Federal law.
CA1700801140719	000111		

3. Generator's Name and Mailing Address
BAY AREA ENVIRONMENTAL
1125 HENSLEY
RICHMOND, CA 94804
4. Generator's Phone (415 233 8001)

A. State Manifest Document Number: 87005896
B. State Generator's ID: CA1700801140719

5. Transporter 1 Company Name: STEVES TRUCKING MATERIALS
6. US EPA ID Number: CAD063154171
C. State Transporter's ID: 801160/801159
D. Transporter's Phone: (408)-263-1176

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
CHEMICAL WASTE MANAGEMENT INC.
35251 OLD SKYLINE RD.
KETTLEMAN CITY, CA 93239
10. US EPA ID Number: CAT000614611
G. State Facility's ID: CAT000614611
H. Facility's Phone: (209)-386-9711

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. HAZARDOUS WASTE, SOLID, N.O.S., (ORM-E, NA 9187)	001	CM	010210	Y	State 611 / EPA/Other N/R
b.					State / EPA/Other
c.					State / EPA/Other
d.					State / EPA/Other

J. Additional Descriptions for Materials Listed Above
a) acid spill clean-up- neutralized w/caustic soda
LINES 2,3,13,14 NOTE: SPILL OF MATERIAL OCCURED

K. Handling Codes for Wastes Listed Above
a. 03 b.
c. d.

15. Special Handling Instructions and Additional Information
CAUTION: USE PROPER SAFETY GEAR, RUBBER GLOVES + SAFETY GOGGLES.

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month	Day	Year
DAVID BURTON	David Burton	10	21	87

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Bill Adams		10	21	87

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Danny G. Damigo		10	23	87

GENERATOR
TRANSPORTER
FACILITY

IN CASE OF AN EMERGENCY OR SPILL, CALL THE NATIONAL RESPONSE CENTER 1-800-424-8802; WITHIN CALIFORNIA CALL 1-800-852-7550

87005896

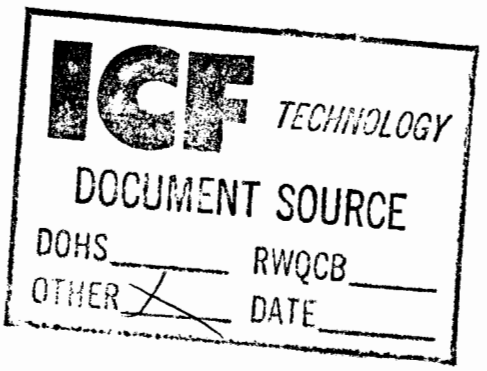
DHS 8022 A (1/87)
EPA 8700—22
(Rev. 9-86) Previous editions are obsolete.

Yellow: TSDF SENDS THIS COPY TO GENERATOR WITHIN 30 DAYS

INSTRUCTIONS ON THE BACK

KLEINFELDER

GEOTECHNICAL INVESTIGATION AND MONITORING WELL INSTALLATION REPORT ABOVE-GROUND TANKS AND STORAGE MEZZANINES BAY AREA ENVIRONMENTAL FACILITY RICHMOND, CALIFORNIA



February 9, 1989

A Report Prepared for:

Bay Area Environmental
1125 Hensley Street
Richmond, California 94801

GEOTECHNICAL INVESTIGATION AND MONITORING WELL INSTALLATION ABOVE-GROUND TANKS AND STORAGE MEZZANINES BAY AREA ENVIRONMENTAL FACILITY RICHMOND, CALIFORNIA

Kleinfelder Job No. 10-1913-02

by

Timothy D. Huntting
Staff Engineer

Mark A. Klaver
Project Manager

John R. McConnell, P.E., G.E.
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2121 North California Boulevard, Suite 570
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February 9, 1989

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PLATES

APPENDIX A

1 INTRODUCTION

This report presents the results of geotechnical investigation for the proposed above-ground storage tanks and storage mezzanine project at Bay Area Environmental's Richmond, California facility. A vicinity map showing the location of the site is presented on Plate 1. Our investigation has been coordinated with Mr. Tom Meichtry of Bay Area Environmental (BAE).

1.1 PROJECT DESCRIPTION

The proposed project consists of two above-ground storage tanks and two mezzanine structures. The storage tanks are 20 ft high and 8 ft in diameter. They will hold 8,000 gallons of a fluid with a specific gravity of 1.1. The storage mezzanines are 1,200 and 2,000 sq ft by 17 ft high steel framed structures with storage racks.

Additional details of the planned construction are not known. If actual loads differ significantly from those assumed, we should be contacted to review and/or revise our recommendations.

1.2 PURPOSE AND SCOPE OF SERVICES

The purpose of this investigation is to evaluate the proposed development with respect to site soil characteristics and to provide geotechnical recommendations and opinions concerning the following:

- Site preparation and grading
- Excavation and backfill
- Foundations
- Slabs-on-grade
- Lateral earth pressures
- Pavements
- Site drainage.

Additionally, soil and ground water samples were collected and submitted to BAE for chemical analysis. The samples were collected so BAE could develop information on existing environmental conditions near the proposed structures.

The scope of services, as outlined in our December 14, 1988, proposal, consisted of field explorations, soil and water sample collection, geotechnical laboratory testing, and preparation of this report.

1.3 AUTHORIZATION

This investigation was authorized by our contract dated December 14, 1988, with Bay Area Environmental, Inc., signed by Tom Meichtry.

2 SOILS AND GROUND WATER

2.1 SITE DESCRIPTION

The project site is located at 1125 Hensley Street in Richmond, California. The site encompasses an area of approximately 3/4 acres. Except for the building areas and some landscaped areas between the streets and perimeter fence, the site has been paved with asphalt concrete. Where traffic has been heavy, areas of the pavement have deteriorated and exhibit extensive "alligator" crack patterns. Near the rear of the property, along a drainage swale, the pavement has deteriorated to the point that the asphalt is loose and the aggregate base has mixed with subgrade soil. The main access drive area, southwest of the existing building appears to have been resurfaced with an overlay of asphalt concrete subsequent to the initial construction. The pavement surface is this area is in good condition.

Regional geology and seismicity near BAE's facility was investigated by Kleinfelder in an earlier phase of work. Results of that investigation were presented to BAE in a letter report dated October 19, 1988.

2.2 FIELD INVESTIGATION

2.2.1 SOIL BORINGS AND SOIL SAMPLING

Our field investigation was performed on December 16 and 19, 1988 and consisted of drilling three borings, soil sampling and completion of the borings as monitoring wells at the approximate locations shown on the Boring/Monitoring Well Location Map, Plate 2. The borings were drilled with a truck-mounted CME 55 drill rig equipped with 8 1/4-inch diameter, hollow stem, continuous flight augers. All test borings were logged by either Kleinfelder geologists or engineers.

The borings were advanced adjacent to the proposed storage tank and storage mezzanine structures to a maximum depth of 35.5 feet. Materials encountered in each soil boring were visually classified in accordance with the Unified Soils Classification System and a continuous log was recorded. The boring logs are presented on Plates 4 through 10, with a copy of the boring log legend included as Plate 3. Well construction details are also provided on the Plates for the soil borings completed as monitoring wells.

Soil samples were obtained by driving a 2-inch-ID, 2-1/2-inch-OD modified California Sampler, containing clean brass liners, into the bottom of the boring. The number of blows required to drive the last 12 inches of an 18 inches drive with a 140 lb. hammer dropping 30 inches is recorded as the Penetration Resistance (Blows/ft) on the boring logs. When the sampler was withdrawn from the boring, the brass liners containing the samples were removed, examined for logging, labeled and sealed. The lowermost brass tube from each sample drive was collected for geotechnical testing. The middle brass tube from each sample drive was collected for environmental purposes.

Soil samples collected for environmental purposes were immediately sealed with teflon lined plastic caps and placed in refrigerated storage and turned over to BAE personnel under chain-of-custody control.

2.2.2 MONITORING WELL CONSTRUCTION

Each of the soil borings were completed as ground water monitoring wells under permit from the Contra Costa County Department of Environmental Health. Ground water was encountered at depths between 14 and 18 feet below grade. The wells were completed to depths ranging from 25 to 34 feet below the surface using 2-inch, schedule 40 PVC casing. Factory slotted casing screen (0.02-inch slots), with solid bases, were installed from the bottom of each boring to a height between 3.5 and 10 feet above the ground water table as encountered in each boring during drilling. A filter pack consisting of washed Lonestar #2/12 sand was placed by tremmie method in the borehole annulus to depths 2 feet above the screened sections of the wells. Well seals consisting of 1 foot of bentonite pellets topped by cement/bentonite grout were placed above the seals to the surface. The bentonite pellets were allowed to hydrate at least 30 minutes before grout placement reducing the likelihood of grout entering the sand pack zones of the wells. The wells were set within locking Christy-type boxes installed slightly above grade to reduce the potential of surface runoff entering the box.

Soils generated during drilling were placed into 55-gallon, DOT 17H drums supplied by Bay Area Environmental.

2.2.3 MONITORING WELL DEVELOPMENT AND SAMPLING

A Kleinfelder sampling technician developed, purged and sampled the wells on December 19, 1988. The depth to water was measured in each of the wells and each was checked for floating product layer prior to development and sampling. No floating product or odors were observed in any of the wells. Prior to sampling, the wells were developed using a surge block and suction pump to remove suspended sediment within the well water and to stabilize the well sand pack. A subsequent purge of a minimum of four well water volumes was completed in each well before sampling. During purging, general water quality parameters were monitored to ensure representative ground water sample collection. Each well was then sampled using a clean teflon bailer.

The water samples collected were decanted into triplicate 40 ml VOA glass vials and duplicate 1 liter glass bottles and were immediately submitted to BAE personnel at the site under chain-of-custody control. No preservatives were added to the samples. Copies of the chain-of-custody forms are attached at the back of this report.

2.3 GEOTECHNICAL LABORATORY TESTING

The laboratory testing program was formulated with emphasis on the evaluation of the physical characteristics and engineering properties of selected, relatively undisturbed soil samples. The laboratory testing program consisted of unit weight and moisture content, Atterberg Limits, unconfined compression, percent passing the #200 sieve, and resistance value. Most of the laboratory test results are presented on the individual logs of borings. The resistance value test results are summarized on Plate 11.

2.4 SUBSURFACE CONDITIONS

At locations of the three borings drilled for this investigation, the pavement section was found to consist of 3 inches of asphalt concrete overlying 6 to 9 inches of aggregate base. The subsurface soils encountered at the site generally consist of wet, stiff to very stiff sandy and silty clays to the maximum depths explored. In boring B-3 below a depth of

approximately 23 feet, a medium dense silty sand layer overlying a dense gravelly clayey sand was encountered. These layers were not observed in the other two borings.

The upper 4 to 6 feet of soil is a dark gray-brown to black silty clay of high plasticity and has a high potential for volume changes with fluctuations in moisture content. This layer grades to light brown and tan, stiff and very stiff silty and sandy clays of medium to low plasticity. The upper 1 to 2 feet of the dark gray-brown and black clay is slightly stiffer than the underlying soil and has the appearance of being artificially placed. We assume that this material was disturbed then recompacted in conjunction with the construction of the existing structures and pavement.

Ground water was first encountered in the borings at depths of about 14 to 18 feet below existing grades. The ground water levels rose to a depth of about 9 feet below existing grades at the end of drilling. Prior to well development, ground water levels were measured to be between approximately 5.5 and 7 feet below grade.

The above is a general description of soil and ground water conditions encountered at the site in the three test borings drilled for this investigation. A more detailed description of the soil conditions is presented on the boring logs.

Soil and ground water conditions can deviate from those conditions encountered at the boring locations. Should this be revealed during construction, Kleinfelder should be notified immediately for possible revisions to the recommendations that follow.

3 CONCLUSIONS AND RECOMMENDATIONS

3.1 CONCLUSIONS

Based upon data collected during this investigation, it is our opinion that the site is suitable for the proposed construction. Surface soils underlying the site are expansive and generally stiff. Underlying the expansive soils are stiff to very stiff clays. Ground water was first encountered below depths of 14 feet and rose to 5.5 feet after drilling indicating that it is possibly confined. The local ground water levels can fluctuate, however, depending on factors such as seasonal rainfall, ground water withdrawal and construction activities on this or adjacent properties. The influence of these time dependent factors could not be determined at the time of our investigation.

The primary geotechnical considerations for this project are: (1) expansive soils; (2) total and differential settlements resulting from anticipated structural loads; and (3) proper subgrade preparation and site grading.

3.2 RECOMMENDATIONS

3.2.1 SITE PREPARATION AND GRADING

Final grading plans were not available to us at the time this report was prepared. We anticipate that required grading will involve cuts and fills less than 1 foot to achieve level building pads and to maintain proper site drainage.

Final grading plans should be reviewed by the geotechnical engineer for conformance to our design recommendation prior to construction bidding.

In general, site preparation and grading should be performed in accordance with the Guide Specifications for Earthwork provided in Appendix A and the site specific recommendations which follow. A brief summary of compaction recommendations is

presented in Table 1. Additional earthwork recommendations are presented in related sections of this report.

Prior to construction, the proposed building and storage tank areas should be scarified to a depth of 12 inches to locate and remove near-surface rubble, debris, structures, and utilities. Scarified areas should be moisture conditioned as necessary and recompacted in accordance with the recommendations contained in Table 1.

Engineered fill should be placed to the compaction level recommended in Table 1. It is recommended that any import fill used on site be of a low to non-expansive nature and should meet the following minimum criteria:

Plasticity Index	less than 13
Liquid Limit	less than 30
Percent Soil Passing #200 Sieve	less than 30%

TABLE 1

SUMMARY OF COMPACTION RECOMMENDATIONS

Area	Compaction Recommendation (3)
General Engineered Fill	Compact in lifts no greater than 8 in. loose thickness to a minimum of 90 percent relative compaction at 2 to 4 percent over optimum moisture content.
Trenches (1) 0 - 30 in. (2)	Compact to a minimum of 90 percent relative compaction at 2 to 4 percent over optimum moisture content.
Below 30 in.	Compact to a minimum of 85 percent relative compaction at 2 to 4 percent over optimum moisture content.
New Concrete Floor Slabs (1)	Compact 12 in. of subgrade between 88 to 92 percent relative compaction 2 to 4 percent over optimum moisture content.
Storage Tank Foundations (1)	Compact 12 in. of subgrade between 90 to 94 percent relative compaction 2 to 4 percent over optimum moisture content.
Parking and Access Driveway (1)	Compact 12 in. of subgrade to a minimum of 90 percent relative compaction 2 to 4 percent over optimum moisture content.

NOTES:

(1) Depths are below finished subgrade elevation.
(2) For landscaping areas only, percent compaction in trenches may be reduced to 85 percent.
(3) All compaction requirements refer to relative compaction as a percentage of the laboratory standard described by ASTM D-1557.

All import fill should be compacted to the general recommendations provided for engineered fill. Grading operations during the wet season or in areas where the soils are saturated may require provisions for drying of soil prior to compaction. If the project necessitates fill placement and compaction in wet conditions, we could provide alternatives for drying the soil. Conversely, additional moisture may be required during the dry months. Water trucks should be available in sufficient number to provide adequate water during compaction.

All site preparation and fill placement should be observed by a representative of the geotechnical engineer. It is important that during the stripping and scarification process, a representative of the geotechnical engineer be present to observe whether any undesirable material is encountered in the construction area.

3.2.2 EXCAVATION AND BACKFILL

Excavation for footings and utility trenches can be readily made with either a backhoe or trencher. We expect the walls of trenches less than five feet deep to stand near vertical for a period of several days without significant sloughing.

Where trenches are extended deeper than 5 feet, the excavation may become unstable and should be evaluated to monitor stability prior to personnel entering the trenches. Shoring or sloping of any deep trench wall may be necessary to protect personnel and to provide stability. All trenches should conform to the current CAL-OSHA requirements for work safety.

Backfills for trenches or other small excavations within pavement areas and beneath slabs should be compacted as noted under Table 1 and in accordance with the Guide Specifications for Earthwork presented in Appendix A.

Special care should be taken in the control of utility trench backfilling in the pavement areas. Poor compaction may cause excessive settlements resulting in damage to the pavement structural section.

3.2.3 FOUNDATIONS

It is our understanding that building loads will be transmitted to supporting soils through isolated columns and continuous wall footings and that the storage tanks will be supported by a mat foundation. Based on the data collected, building loads may be adequately supported by spread footings.

The recommended soil bearing pressures, depths of embedment and minimum width of footings are presented in Table 2. The bearing values provided have been calculated assuming that all footings uniformly bear on the existing near-surface silty clays or at least

12 inches of engineered fill. It is also assumed that the existing processed material was properly compacted during the original construction. To verify this assumption, we strongly recommend that Kleinfelder be retained to observe all footing excavations during construction.

TABLE 2

FOUNDATION BEARING VALUES RECOMMENDATIONS

Footing Type	Allowable Bearing Pressure* (psf)	Minimum Embedment** (in)	Minimum Width (in)
Continuous Wall	2,000	24	12
Isolated Column/Tank Foundation	2,500	18	36

* Dead plus live load
** Below lowest adjacent grade

Allowable soil bearing pressures may be increased by one- third for transient applications such as wind and seismic loads.

Footing concrete should be placed neat against undisturbed soil, if possible. Footing excavations should not be allowed to dry before placing concrete. If shrinkage cracks appear in the footing excavations, the soil should be thoroughly moistened to close all cracks prior to concrete placement.

Provided the recommendations of this report are followed, we estimate that the total maximum foundation settlements will be on the order of 3/4 inches. Maximum differential settlements are not expected to exceed 1/2 inches.

3.2.4 SLABS-ON-GRADE

Slabs-on-grade for this project will consist of concrete pavement, and possibly new floor slabs and exterior flatwork.

The near-surface soils are moderate to highly expansive and will be subject to shrink/swell cycles with fluctuations in moisture content. To reduce these potentially adverse effects, we recommend that slabs be underlain by 12 inches of non-expansive engineered fill placed on subgrade prepared as described below. If the owner is willing to accept some additional risk for potential damage due to expansive soils, slabs can be placed on properly moisture conditioned native soils, as described below.

3.2.4.1 Concrete Floor Slab

The concrete floor slab subgrade should be prepared by scarifying to a depth of 12 inches and recompacting the soil in accordance with the recommendations in Table 1.

Concrete slabs-on-grade should be supported on at least 6 inches of clean gravel or crushed rock to provide a capillary moisture break and uniform support for the slab, in addition to the 12 inches of engineered fill. It is important that placement of this material and concrete be done as soon as possible after compaction of the subgrade to prevent drying of the subgrade soils. If the subgrade is allowed to dry out prior to slab-on-grade construction, we recommend that subgrade soils be saturated by flooding prior to slab construction. A representative of Kleinfelder should be present to verify condition of the subgrade prior to construction of the slabs.

Slab thickness and reinforcing should be designed by a Structural Engineer. As a minimum, we suggest that slabs be at least 4 inches thick and be reinforced with 6x6 - W2.9xW2.9 welded wire fabric, or No. 3 deformed reinforcing bars at 18 inches on center each way. Special care should be taken to insure that reinforcement is placed at the slab mid-height, particularly when using welded wire fabric.

For slabs-on-grade with moisture-sensitive surfacing, we recommend that an impermeable membrane be placed over the clean gravel or crushed rock layer to prevent migration of moisture vapor through the concrete slab. In order to promote a more uniform curing of the slab and to provide protection of the vapor barrier, 2 inches of fine sand should be placed on top of the membrane prior to placing the slab concrete. The sand should be moistened slightly immediately prior to placing concrete.

3.2.4.2 Concrete Pavements

Concrete pavements should be constructed over subgrade material having an R-value of 40 or greater. Based on our laboratory results, the R-value of the existing soils at the project site is too low to accommodate concrete pavements. The in-situ soil can be treated with lime to achieve an R-value of 40 or imported soils or aggregates with R-values greater than 40 can be utilized beneath concrete pavements. Because of the size of the project, we assume lime treatment will not be cost effective. However, we could provide your designer with lime treatment recommendations if you wish to consider this alternative. Recommendations for rigid pavement design may be found in the pavement section.

3.2.5 LATERAL EARTH PRESSURES

Lateral earth pressures will be imposed on all retaining walls and below ground structures, including foundations. Table 3 lists equivalent fluid densities which should be used for design of walls and permanent below ground structures. Values are provided for on-site soils (expansive) and non-expansive backfill. Walls whose tops are not free to deflect should be designed for an at rest condition while an active case can be applied for walls that are free to deflect at the top.

TABLE 3

LATERAL EARTH PRESSURES

Equivalent Fluid Density, pcf

Non-Expansive Earth Pressures	Non-Expansive Backfill	Native Soil
Active	35	70
At rest	50	100
Passive (Ultimate)	350	400

These values apply to horizontal backfill and do not include surcharge loads or hydrostatic pressures that might be caused by ground water or water trapped behind the structure. Retaining walls should be well-drained to minimize hydrostatic pressures. A typical drainage system consists of a 1 to 2 feet wide zone of CalTrans Class II Permeable material immediately adjacent to the structure with a perforated pipe at the base of the structure discharging to a storm drain or other discharge facility.

In computing allowable passive pressures, we recommend that a factor of safety of 2.0 be applied to the ultimate value presented above. We recommend that the passive resistance be neglected for the top 12 inches below design grade.

Non-expansive backfill should be used in the zone immediately adjacent to the structure. In order to use the recommended values for non-expansive backfill, the width of this zone should be equal to or greater than one-half the height of the structure. Non- expansive fill should meet the following minimum criteria:

Plasticity Index	less than 10
Liquid Limit	less than 30
Percent Soil Passing #200 Sieve	less than 30%

Backfill against structures should be compacted between 85 and 90 percent relative compaction near the optimum moisture content. Over-compaction should be avoided because increased compaction effort can result in lateral pressures significantly higher than those recommended above.

Base resistance between concrete and native soils can be computed based on a coefficient of sliding friction of 0.33.

We recommend that design drawings of retaining walls showing height of wall; backfill material type, drainage details and the earth pressures used in design be reviewed by Kleinfelder for conformance to the recommendations given. Certain proprietary wall systems, such as Reinforced Earth Walls and Crib Lock Walls, are design-built systems requiring close coordination with the Civil Engineer on drainage outlets and connections. If any proprietary walls are planned, we strongly recommend that we review the type of wall proposed and make alternate appropriate lateral earth pressure recommendations for these walls. Furthermore, we recommend that Kleinfelder be retained to review design plans prior to issuance for construction.

3.2.6 PAVEMENTS

Pavement for this project will consist of both flexible (asphalt concrete) and rigid (portland cement) pavement sections. We assume vehicle loading for this project will be moderate

and consist primarily of forklift and medium-sized trucks. For this use, we estimate traffic indices of 4 to 6.

We have made our pavement designs assuming the pavement subgrade soil will be similar to the near-surface silty clay soils described in the boring logs. This assumption is based on our understanding that grading and soil removal in the paved areas will be minimal. If site grading exposes soil other than that assumed, we should perform additional tests to confirm or revise the recommended pavement sections for actual field conditions.

Test results on a bulk sample of near-surface soil indicates a Resistance (R) Value of 5. Based on this design R-Value and the CalTrans Pavement Design Methods, alternative pavement sections are presented for different Traffic Indices (T.I.) in Table 4. Each T.I. represents a different level of use. The owner or designer should determine which level of use best reflects the project and select appropriate pavement sections. If the assumed traffic indices are not appropriate to the planned use, Kleinfelder should be retained to develop suitable supplemental pavement sections.

TABLE 4

PAVEMENT DESIGN
R-Value = 5

	Portland Cement (Rigid)		Asphalt Cement (Flexible)					
				Alternate 1		Alternate 2		
T.I.	PCC	AB	Import	AC	AB	AC	AB	ASB
4	6.0	4.5	4.5	2.5	7.5	3.0	6.5	--
5	6.0	4.5	6.5	2.5	11.0	3.0	10.0	--
6	6.0	4.5	7.5	3.0	13.5	3.0	6.0	8.5

Note: Thicknesses shown are in inches

AC = Type B Asphalt Concrete
AB = Class II Aggregate Base
ASB = Class II Aggregate Subbase
PCC = Portland Cement Concrete, 3,500 psi, 6x6 - W2.9 x W2.9 welded wire fabric or #3 bars on 24-in. centers both ways, control joints on 12 to 15 ft centers, subdrains at pavement edges.
Import = non-expansive soil or aggregate material with an R-value of 40 or greater.

We recommend that the subgrade soil over which pavement sections are to be placed be compacted in accordance with the recommendations in Table 1.

During our field exploration, we noted that building rain gutters empty directly onto the existing pavement and that a major portion of the site drains toward the swale near the rear of the property. Drainage from the swale area is poor because the valve in the existing drain pipe is closed, allowing water to pond. Ponded water in this area has had a significant adverse effect on pavement performance. Therefore, we strongly recommend that a storm water collection and drainage system be installed during the proposed construction. A separate system may be appropriate to collect spills of potentially hazardous materials and to keep them from entering the storm water drain system. The storm drain system should include rain leaders from building downspouts and provisions for eliminating surface water ponding.

Parking areas should be sloped and drainage gradients maintained to carry all surface water off the site or to the storm drain system. Surface water ponding should not be allowed anywhere on the site during or after construction. Where concrete curbs are used to isolate landscaping in or adjacent to the pavement areas, we recommend the curbs extend a minimum of 12 in. into the subgrade soil below the baserock to provide a barrier against migration of landscape water into the pavement section. Alternatively, a subdrain system could be constructed to collect excessive water from landscaping irrigation. For long-term performance, we recommend a subdrain system be constructed adjacent to paved/landscaped areas.

In addition, we recommend that all pavements conform to the following criteria:

- All trench backfills, including utility and sprinkler lines, should be properly placed and adequately compacted to provide a stable subgrade.
- An adequate drainage system should be provided to prevent surface water or subsurface seepage from saturating the subgrade soil.
- The aggregate base and asphalt concrete materials should conform to ASTM test procedures and work should be performed in accordance with CalTrans Standard Specifications, latest edition.

4 ADDITIONAL SERVICES AND LIMITATIONS

4.1 ADDITIONAL SERVICES

The review of plans and specifications and the field observations and testing during construction by Kleinfelder are an integral part of the conclusions and recommendations made in this report. If Kleinfelder is not retained for these services, the client will be assuming Kleinfelders' responsibility for any potential claims that may arise during or after construction. The required tests, observations and consultation by Kleinfelder during construction includes, but is not limited to:

- review of plans and specifications,
- observations of foundation construction,
- in-place density testing of fills, backfills and finished subgrades.

4.2 LIMITATIONS

The services provided under this contract as described in this report include professional opinions and judgements based on the data collected. These services have been performed according to generally accepted geotechnical and environmental engineering practices that exist in Northern California at the time the report was written. No other warranty is expressed or implied. This report is issued with the understanding that the owner chooses the risk he wishes to bear by the expenditures involved with the construction alternatives and scheduling that is chosen.

The conclusions and recommendations of this report are for proposed Bay Area Environmental project, as described in the text of this report. The conclusions and recommendations in this report are invalid if:

- the assumed design loads change,
- the structure is relocated,
- the report is used for adjacent or other property,
- the Additional Services section of this report is not followed,

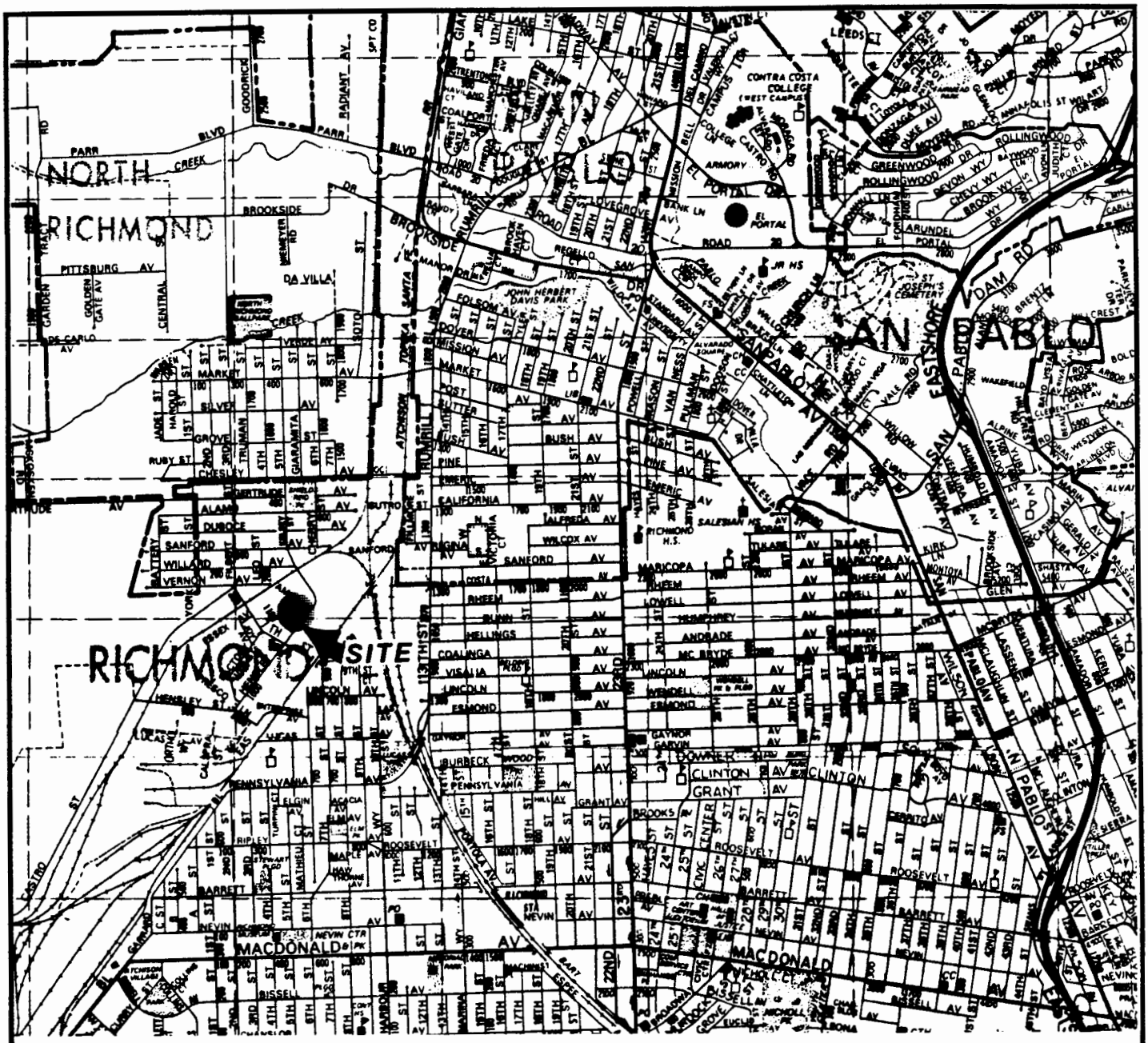
- if changes of grades and/or ground water occur between the issuance of this report and construction, or
- any other change is implemented which materially alters the project from that proposed at the time this report is prepared.

The conclusions and recommendations presented in this report are based on information obtained from the following:

- three borings,
- the observations of our geotechnical engineer and geologist,
- the results of laboratory tests, and
- our experience in the area.

The boring logs do not provide a warranty as to the conditions which may exist at the entire site. The extent and nature of subsurface soil and ground water variations may not become evident until construction begins. It is possible that variations in soil conditions between borings test pits could exist between or beyond the points of exploration or that ground water elevations may change, both of which may require additional studies, consultation and possible design revisions. If conditions are encountered in the field during construction which differ from those described in this report, our firm should be contacted immediately to provide any necessary revisions to these recommendations.

It is the client's responsibility to see that all parties to the project including the designer, contractor, subcontractors, etc., are made aware of this report in its entirety including the Additional Services and Limitations sections.



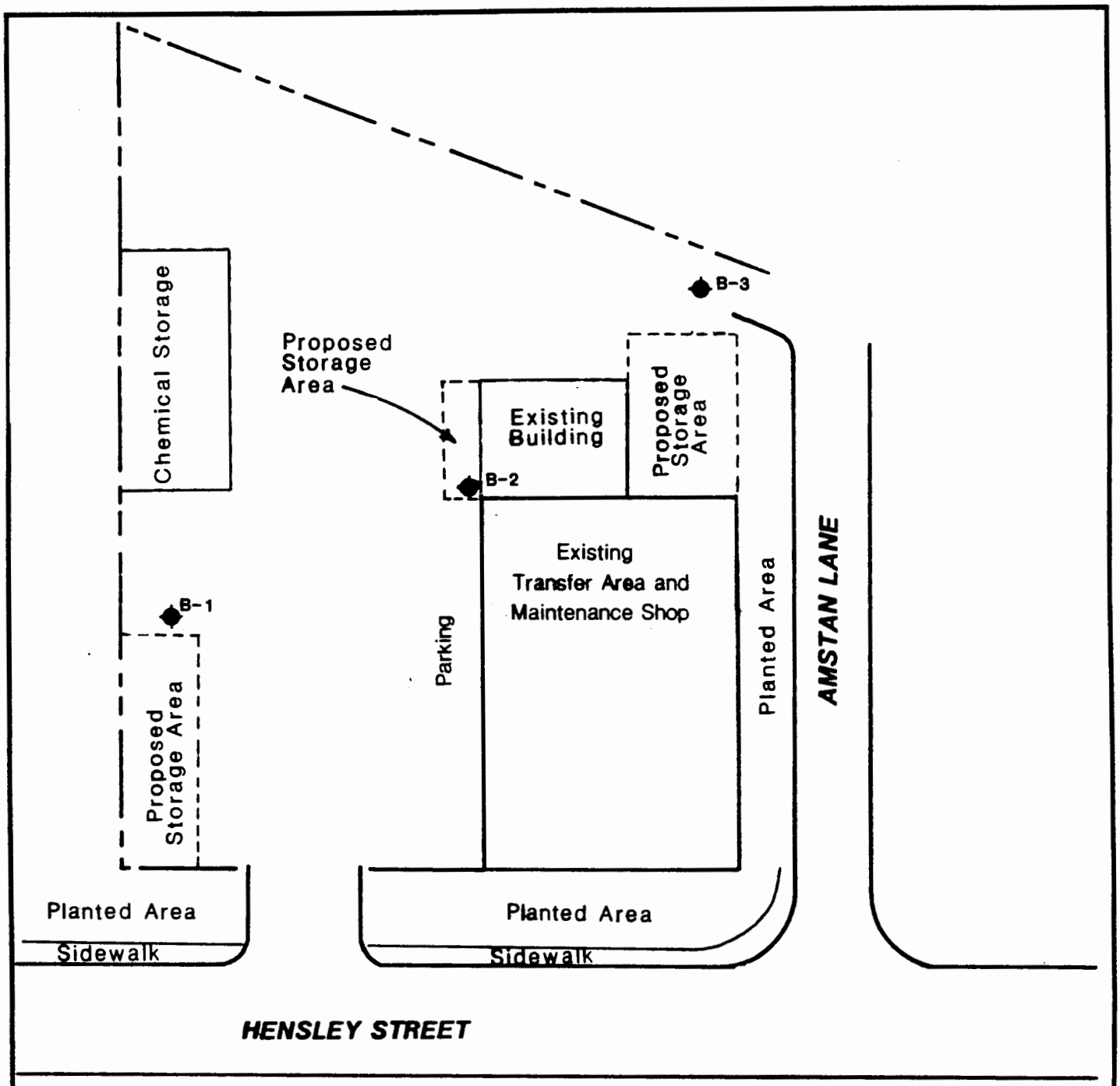
KLEINFELDER

PROJECT NO. 10-1913-01

SITE LOCATION MAP

BAY AREA ENVIRONMENTAL, INC.
RICHMOND, CALIFORNIA

PLATE
1



LEGEND

B-1 BOREHOLE

N

0 40 80 feet

Base map provided by Bay Area Environmental, Inc.

KLEINFELDER

PROJECT NO. 10-1913-01

SITE PLAN

BAY AREA ENVIRONMENTAL, INC.
RICHMOND, CALIFORNIA

PLATE 2

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS		LTR	DESCRIPTION	MAJOR DIVISIONS		LTR	DESCRIPTION
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	G W	Well-graded gravels or gravel sand mixtures, little or no fines.	FINE GRAINED SOILS	SILTS AND CLAYS LL < 50	M L	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
		G P	Poorly-graded gravels or gravel sand mixture, little or no fines.			C L	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
		G M	Silty gravels, gravel-sand-silt mixtures.			O L	Organic silts and organic silt-clays of low plasticity.
		G C	Clayey gravels, gravel-sand-clay mixtures.		SILTS AND CLAYS LL > 50	M H	Inorganic silts, micaceous or diatomaceous fine or silty soils, elastic silts.
	SAND AND SANDY SOILS	S W	Well-graded sands or gravelly sands, little or no fines.			C H	Inorganic clays of high plasticity, fat clays.
		S P	Poorly-graded sands or gravelly sands, little or no fines.			O H	Organic clays of medium to high plasticity.
		S M	Silty sands, sand, and silt mixtures.	HIGHLY ORGANIC SOILS		P t	Peat and other highly organic soils.
		S C	Clayey sands, and clay mixtures.				


Standard penetration split spoon sample


Modified California (Porter) sample


Shelby tube sample


Water level observed in boring

* No recovery

NFWE No free water encountered

NOSC No odor, scent, or fluid cut

LL Liquid limit

PI Plasticity index


Blank casing


Screened Casing


Cement grout


Bentonite


Sand pack or gravel pack

NOTES: Blow counts represent the number of blows of a 140-pound hammer falling 30 inches required to drive a sampler through the last 12 inches of an 18-inch penetration.

The lines separating strata on the logs represent approximate boundaries only. The actual transition may be gradual. No warranty is provided as to the continuity of soil strata between borings. Logs represent the soil section observed at the boring location on the date of drilling only

KLEINFELDER

PROJECT NO. 10-1913-02

BORING LOG LEGEND

BAY AREA ENVIRONMENTAL, INC.
RICHMOND, CALIFORNIA

PLATE 3

KLEINFELDER

Project	Boring No.
Bay Area Environmental, Inc.	
Number: 10-1913-02	B-1
Total Depth: 35.5 feet / Sheet: 1 of 3	

BORING AND MONITORING-WELL DATA SHEET

Location

Owner & Mailing Information	Township/Range/Section
Bay Area Environmental, Inc. 1125 Hensley Street Richmond, CA 94801	Other Identifiers
Site Location (if different)	

Well Location

Show coordinates or distances from surveyed reference point.

Drilling Operations

Drilling Company	Driller/Crew
Spectrum	Ray Livingston, Van Leonard
Rig Make/Model: CME 75	
Bit & Size: 8-1/4-inch O.D. Hollowstem	
Hammer Data: Wt. 140 pounds / Drop 30 inches	

Task	Start (Date, Time)	Finish (Date, Time)
Drilling	12-16-88, 12:05	12-16-88, 13:06
Completion	12-16-88, 13:06	12-16-88, 14:01
Development		

Well Development and Construction

Monumentation	Development Info.
Ref. Pt. Description	
Elevations Ref. Pt. Ground	
Datum	
Markings	

Well Design	Size & Type	Top	Bottom
Surface Casing	Street box	0	0.5 feet
Casing	2-inch PVC	0	34 feet
Well Screen	0.02-inch slot	9 feet	34 feet
Gravel Pack	2/12 Lonestar	7 feet	34 feet
Bentonite	1/2-inch pellets	6 feet	7 feet
Concrete	Neat cement	0	6 feet

Field Hydrologic Operations

Weather: Clear, cool

Recent Rainfall? Irrigation: No

Nearby Wells Pumping? No

Ditches? Utility Courses?

Date	Time	Water Level	Other Observations
12-16-88	12:50	~ 13.5 feet	First encountered in borehole during
12-19-88	12:00	7.05 feet	Below top of casing

Remarks

Plate 4

Date: 12-16-88 GL

Revision Date: _____

KLEINFELDER

Project	Boring No.
Bay Area Environmental, Inc.	B-1
Number: 10-1913-02	
Total Depth: 35.5 feet	Sheet: 2 of 3

LOG OF BORING

Depth (feet)	Field: Sample Number	Field: Sample Type	Field: Recovery (%)	Field: Blows/Ft.	Laboratory: Dry Density (pcf)	Laboratory: Moisture Content (%)	Laboratory: Compressive Strength (tsf)	Laboratory: Pocket Pen (tsf)	Laboratory: Other Tests	USCS	Description	Well Construction
											Asphalt	
											Aggregate base and fill	
2	B1-2.0		100	37	86	27			LL = 57 PI = 35	CL/CH	CLAY - dark olive to black, medium to high plasticity, very stiff, moist, root holes, roots, NOSC	
4	B1-4.0		100	20	101	21	1.6	2.0		CL	CLAY - dark olive, medium plasticity, stiff, moist, root holes, NOSC	
6												
8										CL/CH	SILTY CLAY - olive with olive gray mottling, medium to high plasticity, stiff, damp, NOSC	
10	B1-9.5		100	30	105	17				CL	GRAVELLY SANDY CLAY - yellowish brown with olive mottling, medium to high plasticity, very stiff, damp, NOSC	
12												
14	B1-14.5		100	16				2.0	Percent passing #200 sieve: 78.7%	CL	SANDY SILTY CLAY - olive with some yellowish brown mottling, low plasticity, stiff, damp, some root holes, blocky structure, high silt content, NOSC ▼	
16												
18										CL	SILTY CLAY - yellowish brown with some light gray mottling, low plasticity, very stiff, wet, root holes, blocky structure, high silt content, NOSC	
20	B1-19.5		100	32				2.0				
22												
24	B1-24.5		100	22				2.0		CL	SILTY CLAY - light yellowish brown with some dark brown mottling/oxide staining, low to medium plasticity, very stiff, wet, abundant root holes, high silt content, trace fine sand, NOSC	
26												
28												
30	B1-29.5		100	38				4.0		CL/SC	SILTY SANDY CLAY - as below	

Designated Purpose(s) of Log: Site Characterization

Note: Logs are to be used only for designated purpose(s).

Logged by	Date:	Plate
G. Little/T. Huntting	12-16-88	5
Drafted by: L. Sue	Date: 1-3-89	
Supervised by: M. Klaver		

KLEINFELDER

Project	Boring No.
Bay Area Environmental, Inc.	B-1
Number: 10-1913-02	
Total Depth: 35.5 feet	Sheet: 3 of 3

LOG OF BORING

Depth (feet)	Field: Sample Number	Field: Sample Type	Field: Recovery (%)	Field: Blows/Ft.	Laboratory: Dry Density (pcf)	Laboratory: Moisture Content (%)	Laboratory: Compressive Strength (tsf)	Laboratory: Pocket Pen (tsf)	Laboratory: Other Tests	USCS	Description	Well Construction
32										CL/ SC	SILTY CLAY with a lenses of sandy clay - olive with black mottling, very stiff, low to medium plasticity, wet, NOSC	
34	B1-34.5		100	32				4.0		CL	SILTY CLAY - light yellowish brown with some faint olive mottling, low to medium plasticity, very stiff, damp to wet, abundant root holes, trace roots, NOSC	
36												
38												
40												
42												
44												
46												
48												
50												
52												
54												
56												
58												
60												

Designated Purpose(s) of Log

Site Characterization

Note: Logs are to be used only for designated purpose(s).

Logged by	Date:	Plate
G. Little	12-16-88	6
Drafted by: L. Sue	Date: 1-3-89	
Supervised by: M. Klaver		

KLEINFELDER

Project	Boring No.
Bay Area Environmental, Inc.	B-2
Number: 10-1913-02	
Total Depth: 26.5 feet	Sheet: 1 of 2

BORING AND MONITORING-WELL DATA SHEET

Location

Owner & Mailing Information	Township/Range/Section
Bay Area Environmental, Inc. 1125 Hensley Street Richmond, CA 94801	Other Identifiers
Site Location (if different)	

Well Location

Show coordinates or distances from surveyed reference point.

Drilling Operations

Drilling Company: Spectrum	Driller/Crew: Ray Livingston, Van Leonard
Rig Make/Model: CME 75	
Bit & Size: 8-1/4-inch O.D. Hollowstem	
Hammer Data: Wt. 140 pounds; Drop 30 inches	

Task	Start (Date, Time)	Finish (Date, Time)
Drilling	12-16-88, 07:30	12-16-88, 08:15
Completion	12-16-88, 08:15	12-16-88, 09:00
Development		

Well Development and Construction

Monumentation	Development Info.	Well Design	Size & Type	Top	Bottom
Ref. Pt. Description		Surface Casing	Street box	0	0.5 feet
Elevations Ref. Pt. Ground		Casing	2-inch PVC	0	25 feet
Datum		Well Screen	0.02-inch slot	10 feet	25 feet
Markings		Gravel Pack	2/12 Lonestar	8 feet	25 feet
		Bentonite	1/2-inch pellets	7 feet	8 feet
		Concrete	Neat cement	0	7 feet

Field Hydrologic Operations

Weather	Date	Time	Water Level	Other Observations
Clear, cool	12-16-88	08:00	13.8 feet	First encountered in borehole during drilling
Recent Rainfall? Irrigation? No	12-19-88	13:50	6.33 feet	Below top of casing
Nearby Wells Pumping? No				
Ditches? Utility Courses?				

Remarks

Plate 7

Date: 12-16-88 GL

Revision Date: _____

KLEINFELDER

Project	Boring No.
Bay Area Environmental, Inc.	B-2
Number: 10-1913-02	
Total Depth: 26.5 feet	Sheet: 2 of 2

LOG OF BORING

Depth (feet)	Field: Sample Number	Field: Sample Type	Field: Recovery (%)	Field: Blows/Ft.	Laboratory: Dry Density (pcf)	Laboratory: Moisture Content (%)	Laboratory: Compressive Strength (tsf)	Laboratory: Pocket Pen (tsf)	Laboratory: Other Tests	USCS	Description	Well Construction
											Asphalt	
											Aggregate base	
2										CH	SILTY CLAY - dark olive gray to black, stiff, moist, NOSC	
	B2-2.5		100	19	80	24		2.25				
4												
	B2-4.5		100	13	107	21	1.6	1.25				
6										CL/ CH	SILTY CLAY - olive to light yellowish brown, medium plasticity, firm to stiff, moist, NOSC	
8										CL	SILTY CLAY - light yellowish brown, low plasticity, very stiff, moist to damp, root holes, high silt content, some fine grained sand, NOSC	
	B2-9.5		100	32	104	23		2.5				
12										CL/ SC	SANDY CLAY to CLAYEY SAND - light yellowish brown, low plasticity, stiff/medium dense, wet, some angular and rounded gravel to 1-1/4-inch, NOSC	
14									Percent passing #200 sieve: 57.5%			
	B2-14.5		100	36								
16												
18										CL	SANDY CLAY - light yellowish brown to olive brown with black spots, low plasticity, very stiff, damp to wet, root holes, trace gravel to 1/2-inch, NOSC	
20	B2-19.5		100	39				3.5				
22												
24										CL	SILTY CLAY - light yellowish brown, low plasticity, stiff, wet, abundant root holes, trace fine sand, NOSC	
26	B2-25.5		100	29				1.75				
28												
30												

Designated Purpose(s) of Log

Site Characterization

Note: Logs are to be used only for designated purpose(s).

Logged by	Date:	Plate
G. Little/T. Huntting	12-16-88	8
Drafted by: L. Sue	Date: 1-3-89	
Supervised by: M. Klaver		

KLEINFELDER

Project	Boring No.
Bay Area Environmental, Inc.	
Number: 10-1913-02	B-3
Total Depth: 26.5 feet / Sheet: 1 of 2	

BORING AND MONITORING-WELL DATA SHEET

Location

Owner & Mailing Information	Township/Range/Section
Bay Area Environmental, Inc. 1125 Hensley Street Richmond, CA 94801	Other Identifiers
Site Location (if different)	

Well Location

Show coordinates or distances from surveyed reference point.

Drilling Operations

Drilling Company	Driller/Crew
Spectrum	Ray Livingston, Van Leonard
Rig Make/Model: CME 75	
Bit & Size: 8-1/4-inch O.D. Hollowstem	
Hammer Data: Wt. 140 pounds / Drop 30 inches	

Task	Start (Date, Time)	Finish (Date, Time)
Drilling	12-16-88, 09:45	12-16-88, 10:30
Completion	12-16-88, 10:30	12-16-88, 11:15
Development		

Well Development and Construction

Monumentation	Development Info.	Well Design	Size & Type	Top	Bottom
Ref. Pt. Description		Surface Casing	Street box	0	0.5 feet
		Casing	2-inch PVC	0	25 feet
Elevations Ref. Pt. Ground		Well Screen	0.02-inch slot	8 feet	25 feet
		Gravel Pack	2/12 Lonestar	6 feet	25 feet
Datum		Bentonite	1/2-inch pellets	5 feet	6 feet
Markings		Concrete	Neat cement	0	5 feet

Field Hydrologic Operations

Weather	Date	Time	Water Level	Other Observations
Clear, cool	12-16-88	10:15	~ 18.5 feet	First encountered in borehole during drilling
Recent Rainfall? Irrigation? No	12-19-88	15:30	5.50 feet	Below top of casing
Nearby Wells Pumping? No				
Ditches? Utility Courses?				

Remarks

Plate 9

Date: 12-16-88 GL

Revision Date: _____

KLEINFELDER

Project	Boring No.
Bay Area Environmental, Inc.	B-3
Number: 10-1913-02	
Total Depth: 26.5 feet	Sheet: 2 of 2

LOG OF BORING

Depth (feet)	Sample Number	Sample Type	Recovery (%)	Blows/Ft.	Dry Density (pcf)	Moisture Content (%)	Compressive Strength (tsf)	Pocket Pen (tsf)	Other Tests	USCS	Description	Well Construction
											Asphalt	
											Aggregate base? contaminated with clay	
2	B3-1.5		100	18	100	26	2.0	2.25		CH	SILTY CLAY - dark olive gray to black, medium to high plasticity, stiff, moist, NOSC	
4										CL	SILTY CLAY - light yellowish brown with olive mottling, medium plasticity, stiff, moist, abundant root holes, trace concretions, NOSC	
6	B3-5.0		100	17	99	26	1.4	1.5				
8										CL	SILTY CLAY - olive, low to medium plasticity, very stiff, moist, abundant root holes, NOSC	
10	B3-10.0		100	31				3.5				
12										CL	SILTY CLAY - olive, low to medium plasticity, stiff, moist to damp, blocky structure, high silt content, abundant root casts, NOSC	
14												
16	B3-15.0		100	25				3.0				
18										CL	SANDY SILTY CLAY TO SANDY CLAYEY SILT - light yellowish brown to olive, low to medium plasticity, firm, wet, NOSC	
20	B3-20.0		100	14								
22												
24										SM	SILTY SAND - olive, loose, wet, fine grained sand, silt, some coarse sand and gravel, NOSC	
26	B3-25.0		100	68						SW/SC	GRAVELLY CLAYEY SAND - yellowish brown to olive, dense, locally medium plasticity, wet, fine grained sand, subangular to subrounded gravel to 1/2-inch, NOSC	
28												
30												

Designated Purpose(s) of Log

Site Characterization

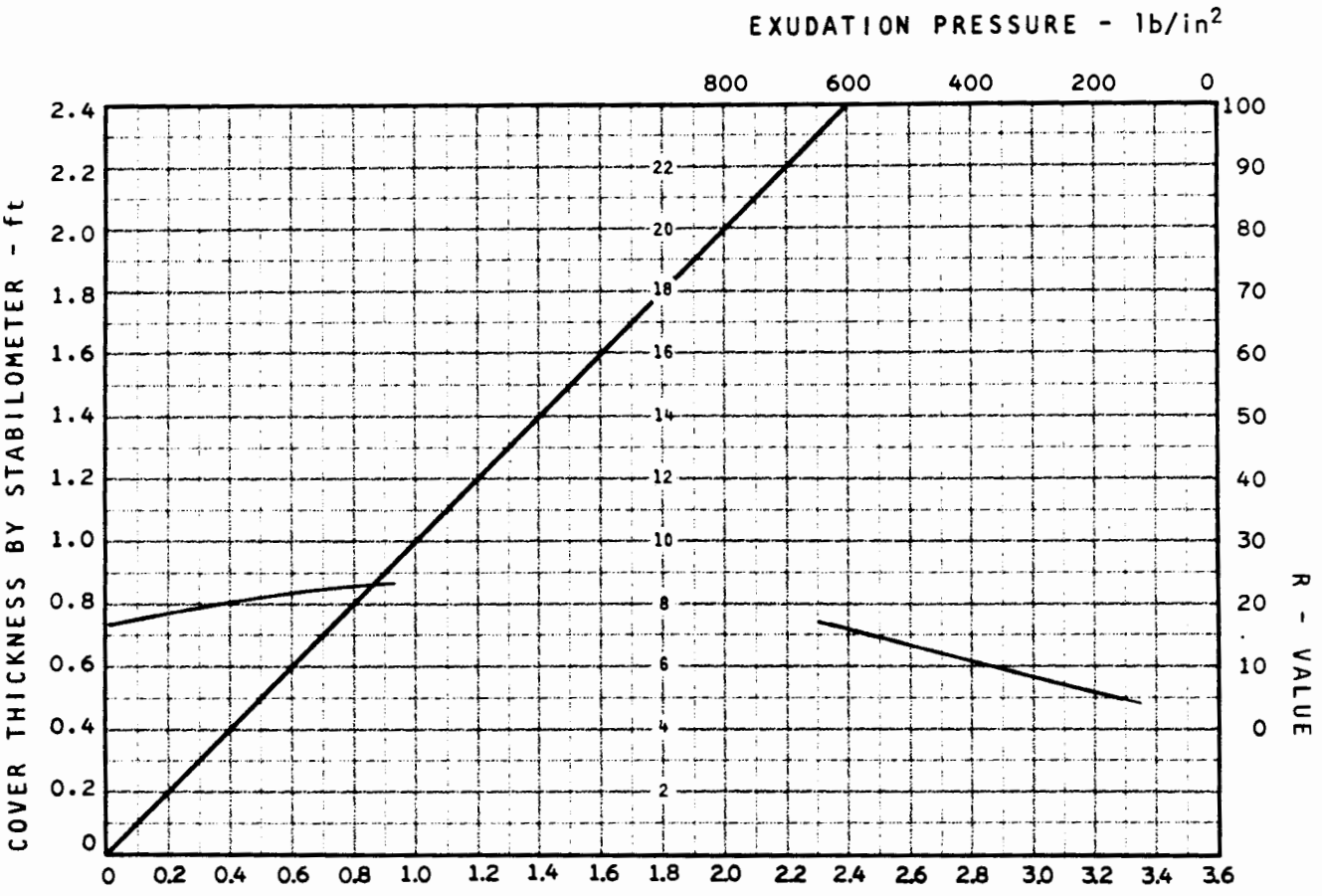
Note: Logs are to be used only for designated purpose(s).

Logged by: G. Little/T. Huntting	Date: 12-16-88	Plate 10
Drafted by: L. Sue	Date: 1-3-89	
Supervised by: M. Klaver		

SAMPLE LOCATION: DRAINAGE SWALE AT REAR OF SITE

SAMPLE DESCRIPTION: DARK BROWN GRAVELLY CLAY

DATE SAMPLED: DECEMBER 16, 1988



SPECIMEN	A	B	C
EXUDATION PRESSURE, lb/in²	600	390	290
EXPANSION DIAL (.0001")	14	10	2
EXPANSION PRESSURE, lb/ft²	61	43	9
RESISTANCE VALUE, R	16	11	8
% MOISTURE AT TEST	18.4	19.6	20.9
DRY DENSITY AT TEST, lb/ft³	112.4	108.7	105.2
R VALUE AT 300 lb/in² EXUDATION PRESSURE		8	
R VALUE BY EXPANSION PRESSURE (TI = 4)		5	

KLEINFELDER

PROJECT NO. 10-1913-02

BAY AREA ENVIRONMENTAL
RICHMOND, CALIFORNIA
RESISTANCE VALUE

PLATE
11

GUIDE SPECIFICATIONS FOR EARTHWORK

I. GENERAL CONDITIONS

A. Scope of Work

These specifications and applicable plans pertain to and include all site earthwork including, but not limited to the furnishing of all labor, tools and equipment necessary for site clearing and stripping, disposal of excess materials, excavation, preparation of foundations materials for receiving fill, installing of retaining wall drains and placement and compaction of fill to the lines and grades shown on the project grading plans.

B. Performance

The Contractor shall be responsible for the satisfactory completion of all site earthwork in accordance with the project plans and specifications. This work shall be observed and tested by a representative of Kleinfelder, Inc., hereinafter known as the Geotechnical Engineer. If the Contractor should fail to meet the technical or design requirements embodied in this document and on the applicable plans, he shall make the necessary readjustments until all work is deemed satisfactory as determined by the Geotechnical Engineer.

No site earthwork shall be performed without prior notification and approval of the Geotechnical Engineer. The Contractor shall notify the Geotechnical Engineer at least twenty-four hours prior to commencement of any aspect of the site earthwork.

As a continuation of his services, the Geotechnical Engineer shall be the Owner's representative to observe the grading operations during the site preparation work and the placement and compaction of fills. Site visits to monitor progress, perform tests, and observe earthwork operation are necessary to monitor the quality of work. Sufficient number of tests and/or observations will be made to enable him to form an opinion regarding the adequacy of the site preparation, the acceptability of the fill, as placed, meets the specification requirements. Any fill that does not meet the specification requirements shall be removed and/or recompacted until the requirements are satisfied.

In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal work hours.

Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures in, on or near the construction site.

C. Site and Subsurface Conditions

A geotechnical investigation has been performed for this site by Kleinfelder. The Contractor should familiarize himself with the geotechnical investigation report and subsurface conditions at the site, whether covered in the report or not, and should thoroughly familiarize himself with all recommendations pertaining to earthwork that are part of this report.

The Contractor shall, upon becoming aware of surface and/or subsurface conditions differing from those disclosed by the geotechnical investigation, promptly notify the Owner and the Geotechnical Engineer as to the nature and extent of the differing conditions, first verbally to permit verification of the conditions, and then in writing. No claim by the Contractor for any conditions differing from those anticipated in the plans and specifications and disclosed by the geotechnical investigation will be allowed unless the Contractor has so notified the Owner and Geotechnical Engineer verbally and in writing, as required above, of such changed conditions.

II. DEFINITION OF TERMS

a. FILL - all soil material placed to raise the natural grade of the site or to backfill excavations.

b. ON-SITE FILL - that which is obtained from the required excavation on the site.

c. IMPORT FILL - that which is hauled in from off-site borrow areas and conforms to the requirements set forth in Section V.

d. ENGINEERED FILL - fill upon which the Geotechnical Engineer has made sufficient tests and observations to enable him to issue a written statement that, in his opinion, the fill has been placed and compacted in accordance with the specification requirements.

e. ASTM SPECIFICATIONS - the 1982 edition of the American Society for Testing and Materials Standards.

f. MATERIALS MANUAL - State of California, Business and Transportation Agency, Department of Transportation, latest revision.

g. PERCENT COMPACTION - the ratio, expressed as a percentage, of the dry density of the fill material as compacted in the field, to the maximum dry density of the same material determined by ASTM Test Method D-1557. Field densities shall be determined in accordance with ASTM D-1556 or ASTM D-2922 and ASTM D-3017.

h. OPTIMUM MOISTURE CONTENT - the ratio, expressed as a percentage, of the weight of the water in the soil material to the weight of the solids in the same soil material as determined by ASTM D-2216 and ASTM D-1557.

III. SITE PREPARATION AND GRADING

The Contractor shall accept the site in its present condition and shall remove from the area of the designated project earthwork all obstructions including existing buildings, trees, footings, slabs, septic tanks, and existing underground utilities such as sewers or storm drains and any other matter determined by the Geotechnical Engineer to be deleterious. Such material shall be removed from the site. Holes resulting from the removal of underground obstructions that extend below finish grades shall be cleared of all loose material and dished to provide access for compaction equipment.

B. Stripping

The site shall be stripped and cleared of all vegetation, debris, and organic-laden topsoil. The stripped material shall be hauled

from the site or stockpiled for landscaping purposes. This material shall not be used in engineered fill.

C. Excavation

After stripping, the site shall be excavated to the required grades. All excavations shall be made true to the grades and elevations shown on the plans and observed by the Geotechnical Engineer. The excavated surfaces shall be properly graded to provide good drainage during construction, prevent ponding of water and aid in dewatering of the excavation if this is required.

All over-excavation below the grades specified shall be backfilled at the Contractor's expense and shall be compacted in accordance with the specifications. The Contractor shall assume full responsibility for the stability of all temporary construction slopes at the site.

IV. SUBSURFACE PREPARATION

Surfaces to receive compacted fill, and those which concrete slabs will be constructed, shall be scarified to a minimum depth of 12 in. and compacted. The scarified soils must be compacted to the requirements set forth in the report for non-expansive soils and on-site expansive soils. All ruts, hummocks or other uneven surface features shall be removed by surface grading prior to placement of any fill materials. All areas which are to receive fill material shall be approved by the Geotechnical Engineer prior to the placement of any fill material.

The top 12 in. of subgrade soils underneath all pavement areas should be compacted to the percent compaction and optimum moisture content recommended in the report.

If subgrade soils are allowed to dry out so that shrinkage cracks appear at the surface, the subgrade should be rescarified, moisture conditioned and recompacted to the specifications given in the report.

V. REQUIREMENTS FOR FILL MATERIALS

All fill material must be approved by the Geotechnical Engineer prior to placement and compaction.

A. Import Fill

Import fill or on-site soil that satisfies these requirements shall be a granular soil or soil-rock mixture which is free of organic matter or other deleterious substances. Import fill shall meet the following requirements:

Plasticity Index	less than 10
Liquid Limit	less than 30%
Percent Soil Passing #200 Sieve	less than 30%

B. Granular Backfill for Retaining Wall Drains

Granular backfill used behind retaining walls and basement walls shall consist of hard, durable clean sand, gravel or crushed stone, and shall be free from organic matter, clay balls and other deleterious substances.

The percent composition be weight of the granular material shall conform to the following grading requirements:

Sieve Size	Percentage Passing Sieve
2"	100
3/4"	90 - 100
3/8"	40 - 100
No. 4	25 - 40
No. 30	5 - 15
No. 50	0 - 7
No. 200	0 - 3

VI. PLACING AND COMPACTING FILL MATERIAL

A. General Earthwork Compaction Requirements

All fill material, except for backfill behind retaining walls and basement walls, trench backfill, and fill which will be subgrade for pavement, shall be compacted to the requirements in the report. Fill shall be compacted in uniform lifts not greater than eight in. in loose thickness. Fills composed of on-site expansive soils shall be compacted above the optimum moisture content.

Before compaction begins, the fill shall be brought to a water content that will permit proper compaction by either: 1) aerating the material if it is too wet; or 2) spraying the material with water if it is too dry. Each lift shall be thoroughly mixed before compaction to insure a uniform distribution of water content.

Field density tests to determine the compaction of the fill shall be made at the locations determined by the Geotechnical Engineer. The results of these tests and compliance with these specifications shall be the basis upon which satisfactory completion of work shall be judged by the Geotechnical Engineer.

If compacted fill materials are allowed to dry out prior to placing subsequent lifts, pavement sections, concrete slabs-on-grade, or sidewalks so that shrinkage cracks appear on the surface of the fill, then the compacted fill must be either scarified, moisture-conditioned, and recompacted before further construction or the fill surface must be saturated by controlled flooding prior to continued construction.

B. Compaction Requirements for Backfill Placed Behind Retaining Walls

Backfill placed behind retaining walls and basement walls shall be compacted to between 85 to 90 percent compaction at ± percent to optimum moisture content. Overcompaction should be avoided. However, if the backfill will be subgraded for a slab-on-grade or sidewalk, then the top two ft of the backfill or that portion of the backfill which extends above the original ground surface, whichever is greater, must be compacted to at least 90 percent compaction at ± percent of the optimum moisture content.

Backfill behind basement walls and other retaining walls and within the building lines shall be placed in thin lifts not greater than eight in. in loose thickness. Where it is impractical to use rollers in close proximity to walls, columns and other improvements, mechanical tampers shall be used. Basement walls shall be braced to prevent displacement and damage while backfill is being placed. Jetting of backfill will not be permitted.

C. Compaction Requirements for Trench Backfill

Backfill for trenches or other excavations within pavement areas should be compacted in 6 to 8 in. layers with mechanical tampers to assure adequate subgrade support. Jetting and flooding should not be permitted. The backfill shall be compacted to a minimum of 85 percent compaction to within 30 in. of the finished subgrade. The top 30 in. shall be compacted to at least 90 percent compaction, with the uppermost 12 in. compacted to the requirements in the report.

D. Installing Drains

Retaining wall drains shall be placed behind basement walls at locations and elevations shown on the plans. All drain pipes should be placed on a minimum of 2 in. of granular materials.

Lengths of perforated metal, bituminized-fibre, plastic or aluminum pipe shall be joined by couplers. Perforated pipe shall be laid with the perforations down.

VII. TREATMENT AFTER COMPLETION OF EARTHWORK

After earthwork operations are completed and the Geotechnical Engineer has finished his observation of the work, no further excavation or filling shall be done except with the approval of and under observation of the Geotechnical Engineer.

It shall be the responsibility of the Contractor to prevent erosion of freshly graded areas during construction and until such time as permanent drainage and erosion control measures have been installed.

CHAIN OF CUSTODY RECORD

SAMPLERS: *(Signature)* Gregory E. Hutto

Phone: 938 5610

SHIP TO: Bay Area Environmental

ATTENTION: Tom Meichtry

Phone No.

SHIPPING INFORMATION

Shipper K&L Cole

Address W.C.

Date Shipped 12.16.88

Shipment Service by hand

Airbill No.

Cooler No.

Relinquished by: *(Signature)*	Received by: *(Signature)*	Date/Time
Gregory E. Hutto	Mohammad R Shoaei	
Relinquished by: *(Signature)*	**Received by:** *(Signature)*	**Date/Time**
Relinquished by: *(Signature)*	**Received by:** *(Signature)*	**Date/Time**
Relinquished by: *(Signature)*	**Receive for laboratory by*:** *(Signature)*	**Date/Time**

* Analysis laboratory should complete, "sample condition upon receipt", section below, sign and return top copy to J. H. KLEINFELDER & ASSOCIATES, 1901 Olympic Blvd., Suite 300, Walnut Creek, California 94596

Sample Number	Site Identification	Date Sampled	Analysis Requested	Sample Condition Upon Receipt
B-2 25'	21513-02 BAE	12 16 88		Good
B2 45'				

LAB INSTRUCTIONS: Laboratory reports should reference and be billed by site ID# and contain the following:

(1) summary of analytical methodology and QA work (blanks, spikes, duplicates)
(2) dates for (a) sampling, (b) lab receipt, (c) extraction, (d) injection/analysis
(3) detection limits for all constituents analyzed for and reporting of all constituents detected which were not specifically designated
(4)
(5)

White - Sampler Canary - J. H. Kleinfelder & Associates Pink - Lab Courtesy Copy

CHAIN OF CUSTODY RECORD

SAMPLERS: (Signature)

Phone: 938 5610

SHIP TO:

ATTENTION: Tom Merchlay

Phone No.

SHIPPING INFORMATION

Shipper KV - Federal

Address W C.

Date Shipped 12-16-88

Shipment Service by Hand

Airbill No.

Cooler No.

Relinquished by: (Signature)	Received by: (Signature)	Date/Time
	Muhammad A. Shaw	12/16/88 1:00 PM
Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Receive for laboratory by*: (Signature)	Date/Time

* Analysis laboratory should complete, "sample condition upon receipt", section below, sign and return top copy to J. H. KLEINFELDER & ASSOCIATES, 1901 Olympic Blvd., Suite 300, Walnut Creek, California 94596

Sample Number	Site Identification	Date Sampled	Analysis Requested	Sample Condition Upon Receipt
B-1-2	15-1713-02 BAE	12-14-88		Good
B-1-4				
B-1-6				

LAB INSTRUCTIONS: Laboratory reports should reference and be billed by site ID# and contain the following:

(1) summary of analytical methodology and QA work (blanks, spikes, duplicates)
(2) dates for (a) sampling, (b) lab receipt, (c) extraction, (d) injection/analysis
(3) detection limits for all constituents analyzed for and reporting of all constituents detected which were not specifically designated
(4)
(5)

White - Sampler Canary - J. H. Kleinfelder & Associates Pink - Lab Courtesy Copy

CHAIN OF CUSTODY RECORD

(Signature)
Doug Heard
(415) 939-3610

TO:
Bay Area Environmental
1105 Wesley
Richmond Ca
ATTENTION: Mohamed Sharif
Phone No. (415) 223-8001

SHIPPING INFORMATION

Shipper Kleinfelder
Address Walnut Creek
Date Shipped 12/19/88
Shipment Service Hand
Airbill No.
Cooler No.
ATTN MARK KLOVER

Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Doug Heard	MC Fisch	12/19/88 17:[illegible]
Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Receive for laboratory by*: (Signature)	Date/Time

* Analysis laboratory should complete, "sample condition upon receipt", section below, sign and return top copy to J. H. KLEINFELDER & ASSOCIATES, 1901 Olympic Blvd., Suite 300, Walnut Creek, California 94596

Sample Number	Site Identification	Date Sampled	Analysis Requested	Sample Condition Upon Receipt
MW-1	10-1913-02	12/19/88		2x40ml
			624	Cool
MW-2				
			Metals	Cool
MW-3	"	"		

LAB INSTRUCTIONS: Laboratory reports should reference and be billed by site ID# and contain the following:

(1) summary of analytical methodology and QA work (blanks, spikes, duplicates)
(2) dates for (a) sampling, (b) lab receipt, (c) extraction, (d) injection/analysis
(3) detection limits for all constituents analyzed for and reporting of all constituents detected which were not specifically designated
(4)
(5)

Thank you